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THE TREATMENT OF DISEASE IN CHILDREN

J. A. SUTHERLAND

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THE TREATMENT OF DISEASE IN CHILDREN

BY

G. A. SUTHERLAND

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PREFACE

In the following pages an attempt has been made to aid the young practitioner in his treatment of the diseases of children. The diseases selected are those peculiar to infancy and childhood, or those calling for special treatment in early life. Many forms of illness are directly dependent on improper feeding, and in order to save repetition the first chapter is devoted to the consideration of food and feeding in health. The preventive treatment of disease has been considered as far as possible, for in early life it is much more under the control of the physician than in later years.

Many methods of treatment are given in the text-books, and the practitioner is often puzzled to know which to select and where to begin. Here he will find the practice of one based on the teaching of many. This explanation may serve to excuse the

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somewhat dogmatic tone of the writer, and the fa
that but few references are made to the writings
the great masters in this branch of medicine. Nor
the less the writer is fully aware that the lines
treatment recommended in these pages which wi
endure have already been suggested by living
dead authors, at home or abroad. If he has su
ceeded in culling from them a selection of ther
peutical measures which will prove useful to th
young practitioner, he will have accomplished h
purpose.

G. A. SUTHERLAND.

WIMPOLE STREET, W.,
March, 1907.

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CHAPTER I

THE FEEDING OF INFANTS AND CHILDREN IN HEALTH

If the method, reputed to be Chinese, of paying a medical adviser only while a patient enjoyed good health were carried out in this country in the case of infants, the result would probably be the saving of many lives, and the raising of the standard of health in the community. As it is the medical adviser is but too frequently called in only for the treatment of diseased conditions, while the general management of the infant, including the very important question of the diet, is entrusted to an ancient member of the family, or a hired nurse, or is based on the information supplied in the advertisement columns of the lay press, or in circulars. Before treating disease resulting from errors of diet it is necessary for a medical adviser to have a clear idea in his own mind of what the normal diet ought to be. He should be prepared to state what is the proper food, the method of its preparation, the frequency of feeding, the amount at each

meal, etc., at any given age for a healthy child. He must also be prepared to modify these according to the effect produced in any given case, recognizing from the symptoms wherein the defect lies, and correcting it not by changing his tools but by using them scientifically.

The best food for an infant during the first nine months of its life is its mother's milk. A newly born infant should be put to the breast within a few hours, and afterwards at regular intervals. The quantity of nourishment at first may be small, but it is sufficient for the purpose until nature increases the supply. Thirst, rather than hunger, seems to be the want during the first few days, and a little plain water may be given to relieve this. Cows' milk, pieces of butter, castor oil, and all such substances, are not called for and may prove injurious. Suckling should be carried out regularly every two hours by day, and every four hours by night, until the child is three months old. After three months the infant may be fed every three hours by day, and once only during the night. The important things are regularity in the feeding-times and the avoidance of too frequent feeding. If the mother has not enough of milk, as judged by the failure of the infant to gain weight under proper rules of feeding, cows' milk may be given alternately with the breast, or as often as may be considered necessary. Loss of weight, or failure to gain weight steadily, and the cry of hunger after

a breast-feed, are the chief indications that some additional nourishment is called for. Breast-feeding must not be stopped simply because the infant is not thriving. Women of certain types make bad nursing mothers. The milk of a nervous woman is apt to vary from time to time with the state of her nervous system, and this may lead not only to periodical disturbance in the infant but even to progressive loss of weight. In such a case if success is to be gained it is necessary for the mother to lead an extremely quiet and retired existence, as far removed from mental and emotional excitements as possible. In all cases it will be found that devotion to the home-life, and to the care of the infant, is essential for the most successful nursing.

An examination of the infant may reveal evidence of constitutional or local disease which is sufficient to explain the failure of nutrition, and which calls for treatment. Syphilis in an infant is no reason for weaning, but if the mother is herself healthy it is a strong reason for continuing the breast-milk, as the infant will probably require the most digestible food. Menstruation is not a reason for ceasing suckling, although if it causes any disturbance in the child, cows' milk may be substituted during the periods. If pregnancy occurs, it is advisable to cease suckling at once, except during the hottest months of summer, when it may be carried on until the arrival of cooler

weather removes the risks attending the adoption of cows' milk as the diet.

Wet-nursing is not a popular institution owing to the many drawbacks attending its use. At the same time, in the case of an infant delicate at birth, and not thriving on artificial food, the great advantages of wet-nursing must be kept in mind. Sometimes after a trial of artificial feeding without success, or for an infant debilitated by acute illness, the best method of treatment is by wet-nursing.

In the absence of breast milk, artificial feeding must be carried out by means of cows' milk, suitably modified to make its composition resemble breast milk as nearly as possible. Although the difficulties in connexion with artificial feeding are numerous they are not so great as some people make out, if only one can secure certain requisites. These are pure fresh milk, clean utensils, clean hands on the part of the nurse, regular feeding, and no overfeeding. In other words, if the food were always pure, and if the feeding were always properly carried out, there would be far less trouble in artificial feeding than at present exists.

The milk should be from a clean dairy farm, and should be delivered as soon as possible after the milking time. The so-called nursery milk which is believed to be from one cow is not to be recommended, but rather the mixed milk of many cows. This is much more likely to be of a proper standard and to be free from tuberculous infection. A

guarantee should be obtained from the dairy that the milk has not been pasteurized, or sterilized, or treated with preservatives, or altered in any other way. The milk should be delivered in air-tight bottles which have been sterilized before being used. Unboiled milk is probably the most nutritious form of diet, but if there is any doubt as to the purity of the milk, or any difficulty in keeping it fresh in the house, it should be boiled on delivery. The usual plan is to put the milk in a clean pan and bring it to the boil. This probably secures the object in view, but has the disadvantage of so altering the taste of the milk as to render it unpalatable for some infants. A better plan is to put the milk-containing pan into another containing water, and to bring the water to the boil. The boiling should be continued for five minutes, at the end of which time the milk will have been raised to the same temperature, and should be removed and cooled rapidly. The milk itself has not been boiled, because the boiling point of milk is higher than that of water and thus the change in the taste is not induced. The milk is then to be transferred to a clean glass vessel, fitted with a lid, or covered with fine muslin, or plugged with cotton wool, and placed in a cool place, for instance the outside ledge of the window. In hot weather the milk should always be kept on ice.

Before being given to an infant, milk must be modified in order to bring the proportion of the

solids as nearly as possible to that existing in breast milk. At the same time it must be clearly understood that the chemical composition of the proteids, fats, and carbohydrates in cows' milk thus modified is not the same as in breast milk.

The milk must be diluted with plain water or barley water so as to reduce the amount of proteid. For the first fortnight the dilution may be of the strength of milk to diluent as 1 : 3, and then up to the age of three months 1 : 2. From the age of three to six months the strength may be 1 : 1, and from six to nine months, 2 : 1. Barley water is the popular diluent and acts well if properly prepared. The use of barley meal, or thick barley water, is the cause of much indigestion, and it must be remembered that barley water is not intended as a food but merely as a bland diluent. It should be prepared as follows. A tablespoonful of pearl barley is washed and put in a saucepan with one pint of cold water. This is brought to the boil, and then allowed to simmer beside the fire for half an hour. The water is then strained off and used as required. Barley water should be prepared twice daily, as it does not keep well. Some infants seem to agree better with barley water, and others with plain boiled water, or lime water.

Sugar has to be added to this diluted milk in order to bring it up to the standard. Sugar of milk is the best in that it is the same as exists in breast milk, but for common use it is too expensive.

Extract of malt is composed of glucose and maltose, which are easily digested and absorbed by an infant. It has a marked sweetening power, and renders the milk very palatable. It will also convert any starch present, as when barley water is added to the milk, and is believed to render the curd in the stomach less dense and indigestible. It has therefore many advantages, and is very suitable for common use. Cane sugar may also be employed, and although not so digestible as the other forms it usually acts well, and it has the advantage of being very cheap. The amount of sweetening matter to be added will vary with the age of the infant, and the degree of dilution, but for the first month the addition of half an ounce of sugar of milk or malt extract, or of three drachms of cane sugar, to each fifteen ounces of milk as prepared for use will be found sufficient.

The dilution of the milk renders the addition of some fatty material necessary. It is often advisable, however, to begin bottle feeding without the addition of any extra cream, as the fatty material so frequently causes digestive disturbances. One can thus ascertain first of all whether the artificial food is going to be well tolerated by the infant, and then can add the fatty material in gradually increasing amounts as toleration is established. A pint of good cows' milk will yield one and a half to two ounces of gravity cream. If we use seven ounces of milk diluted with twice its

bulk of water we have to add one ounce of cream to the mixture to bring the milk to the proper standard. If separated cream is used, half the quantity is required, as it usually contains twice as much fat as gravity cream. If the latter can be obtained fresh it is probably more digestible than the separated cream. Amongst the poorer classes fresh butter or codliver oil may be substituted for cream, as being cheaper. Only small quantities are required, one to two drachms *per diem* to begin with. Instead of adding the cream to the milk, one may give a certain number of cream feeds in the day as follows :—Gravity cream, half an ounce ; malt extract, one drachm ; barley water, two and a half ounces. By this means there is a certain amount of variety introduced into the diet, the digestive organs are not all exercised in the same way after each meal, and it is possible to learn in the presence of digestive disturbances which element in the diet is at fault. If the cream feed seems to cause less disturbance than the milk feed, then it is probably the proteids and not the fats which are the cause of trouble.

The number of feeds in the twenty-four hours must be arranged according to the age of the infant, and the times fixed must be closely adhered to. It is very rarely that one meets with an infant who is not being fed often enough, while one is constantly coming across infants who are being fed much too frequently. The interval between meals should be

long enough to allow of complete digestion, and of emptying of the stomach, and of a period of rest for the stomach. As a rule during the first month of life these requirements will be met by feeding every two hours during a day of sixteen hours, i.e. from 7 a.m. till 11 p.m. It is beneficial for the child that during the night of eight hours only one feed should be given, at 3 a.m., thus giving two intervals of four hours for a little extra rest to the stomach. It is of extreme importance that the times of feeding after having been fixed should be rigidly adhered to. Habit is easily established, in the breast as regards the secretion of milk, and in the infant as regards the desire for food, and much trouble will be saved to mother and child by forming regular habits early. If the infant be asleep when the feeding time comes he should be wakened and fed. If he cries before feeding time he is not to be fed, but an examination should be made as to other causes of discomfort, local or general. Wet clothes or cold feet may be the cause of disturbance. In hot weather more especially a common cause of crying is thirst not hunger, and to relieve this plain water or barley water may be given between meals.

The following table is given as a general guide regarding feeding times :—

NUMBER OF MEALS AND HOURS OF FEEDING FOR BREAST OR BOTTLE-FED BABIES.

	By day (16 hours) Interval.	By night (8 hours) Interval.	Number of meals in 24 hours.
Up to 3 months . .	2–2½ hrs.	4 hrs.	10–8
Between 3 and 6 months	2½–3 „	4 „	8–7
Between 6 and 9 months . . .	3 „	8 „	6
Between 9 and 12 months . . .	3½–4 „	9 „	5

In the following table are given the amounts of food at a meal, and the proportion of milk and water in the mixture.

	At each Meal.	Proportion of Milk and Water.
During 1st month . . .	1–1½ ounces	1–3
„ 2nd „ . . .	2–3 „	1–2
„ 3rd „ . . .	3–4 „	1–2
„ 4th „ . . .	4–5 „	1–1
„ 5th „ . . .	4–5 „	2–1
„ 6th „ . . .	5–6 „	2–1
From 7th to 9th month .	6–7 „	3–1
„ 9th to 12th „ . . .	8–9 „	All milk.

In the next table are given the total quantities of food material in twenty-four hours :—

QUANTITIES OF FOOD MATERIAL IN TWENTY-FOUR HOURS.

	Milk (ounces).	Plain or Barley Water (ounces).	Gravity Cream. (ounces).	Sugar or Malt Extract (ounces).
During 1st month .	3–6	10–15	½–2	½–1
„ 2nd „ .	6–8	12–16	2–2½	1–1¼
„ 3rd „ .	8–10	16–20	2–3	1–1½
„ 4th „ .	10–15	10–15	2–3	1–1½
„ 5th „ .	15–20	7–10	2–3	1
„ 6th „ .	20–25	10–12	1–2	1
7th to 9th „ .	25–30	8–10	1–2	1
9th to 12th „ .	30–40	—	1–2	—

These tables are only to be regarded as approximate estimates, and not as definite standards for all infants.

If a child is prematurely born or small at birth it will not be able to digest as much food as a full time or big baby. Attention must always be paid to the capacity and digestive power of the individual stomach. Speaking generally the best guide as to these is the infant's appetite, which will usually indicate correctly the quantity of food at a meal and the proper frequency. An infant should not be coaxed to take food, and it should not be allowed intervals during a meal. A quarter of an hour at the breast or bottle is sufficient time for a young infant, and if the attention flags, or the infant drops off to sleep, the meal should be ended. The habit of putting a bottle beside an infant and leav-

ing it to be emptied when the baby pleases is quite wrong. Another point to be considered is the variation in the amount and quality of the food at different seasons. Less food is required during the hot months than in cold weather, as will be indicated also by the infant's appetite. Without diminishing the amount of fluid diluent, it will be found advisable to reduce in hot weather the amount of milk and cream as given above.

We have been dealing only with the feeding of healthy infants and therefore have not considered the various substitute methods of feeding other than by cows' milk. Asses' milk and goats' milk may be used quite successfully, but there is only a limited supply of them in this country. Laboratory milk, sterilized milk, and humanized milk have failed to establish their superiority over cows' milk as modified at home, and they possess many disadvantages. Predigested milk, tinned milk, and all the so-called "infants' foods," are in no sense of the term complete foods for infants, and they should be reserved for temporary use in the case of illness, under the supervision and control of the medical adviser. They are specially harmful when given to infants under the age of nine months.

Feeding after nine months of age.—At the age of nine or ten months weaning should be commenced, and the process should be completed in from three to four weeks. In the hot months of the summer the suckling may be continued a little longer,

as a certain amount of gastro-intestinal disturbance usually accompanies the weaning process, and the dangers of this are greater in hot weather. The amount of cows' milk for an infant between nine and twelve months is from one and a half to two pints. The latter is a maximum, and many infants will thrive better on the former. Dilution of the milk is not necessary. In addition one to two ounces of gravity cream may be given daily. Some solid food may be added in the shape of boiled bread, or porridge, or pudding. These additions must be small in quantity at first, and must not be given more than twice a day. The meals should not exceed five in number in the twenty-four hours. Spoon feeding should be begun as soon as possible, but as regards that, and also the addition of solids, due deference must be paid to the infant's own desires, which are sometimes very decided. At this age, and even at the age of six months, a few teaspoonfuls of orange juice or grape juice daily will be found to serve a useful purpose in the economy. Dr. Sim Wallace recommends that when the incisor teeth have been cut, the infant should be given some fresh sugar cane, or fruit, or a stale crust to bite and gnaw at. He has done good service in pointing out the faulty nature of a prolonged "pappy diet," and the early decay of the teeth which is apt to follow. Although some infants do not take early to biting, we believe that some such biting process is an excellent training for

the thorough chewing that is so desirable later. It is not advisable to allow the use of a "soother," which is usually a repository for countless organisms, unless a hard one of bone or coral is used, which can be thoroughly cleaned and disinfected.

Between the ages of twelve and eighteen months the amount of solid food may be increased. The porridge may be made thicker and of coarser oatmeal. A little potato and gravy, or half an egg, may be given once a day. Soft bread and butter, or dripping, may be taken. Many children will take in addition two pints of milk in the day, and whatever solid extras are being given, the milk is still to be regarded as the essential part of the diet. After fifteen months the child should be fed every four hours, and there should be no night feeding, and no bottle feeding. Mastication has now been rendered possible by the eruption of the molar teeth, and should be encouraged by giving the child crisp toast, biscuits, and rusks at meal times.

After the age of eighteen months the child may be given once a day fat bacon, or chicken, or fish, or mutton. To begin with this may be pounded or minced, but as soon as the art of mastication has been acquired, there is no preliminary pulverizing required, and teeth, jaws, and naso-pharynx will be more thoroughly developed by full masticatory efforts (Harry Campbell).

Between the ages of two and five years the diet may be still further extended. The following

will indicate sufficiently the nature of the foods to be given :—

1. *Breakfast.* Porridge and milk, *or* bacon, *or* an egg. Cocoa and milk, or plain milk. Bread and butter, or toast and butter. Marmalade.

2. *Dinner.* Fish, such as sole, whiting, haddock, or plaice. Mutton or beef, roast or boiled, hot or cold. Tripe, rabbit, chicken, pigeon.

Fresh vegetables, such as potatoes, cabbage, tomatoes, cauliflower, brussels sprouts, beans, onions.

Puddings such as the plain milk puddings, jam roll, and suet, custard, or marmalade pudding. Some jam, or treacle, or stewed fruit, may be allowed with the puddings. Raw fruit such as apples, oranges, and bananas.

3. *Tea.* Cocoa and milk, or plain milk. Plain biscuit, or cake. Bread and butter ; jam. An egg occasionally.

4. *At bedtime.* Half a glass of milk, if desired.

In family life certain errors are apt to occur frequently in connexion with this fuller dietary. Overfeeding is very common. As regards breakfast, one often finds that after porridge and milk comes an egg or bacon. There should not be more than one solid course, and the rest of the meal should consist of a little bread and butter. At dinner there should not be more than two courses. Meals should not terminate with a fluid or semi-fluid mess of sweet stuff, or the child will tend to eat too much of it. Things which are sweet and slide

down easily must be strictly regulated in amount. If at the end of a meal—sufficient in quantity—the child is still hungry, a hard biscuit or a hard apple will usually suffice. A tendency to like certain foods and to dislike others must be checked. Some children will eat beef or mutton greedily and object to puddings, but a diet of this nature is too stimulating. Most children are very fond of bread and butter, and many partake of it to excess if they are allowed to. This tendency must be kept in check by carefully regulating the amount at a meal. A mixed diet, without too great a preponderance of any one form of food, is the best. A manifest dislike to the fat of beef or mutton, or butter, or cream, must be viewed with toleration, for it is a natural objection with some children, and if no forcing is used it will usually pass off as the child grows. Coaxing to take more food at meals should never be indulged in. One frequently hears of an hour being devoted to coaxing a child to eat his breakfast. Healthy children do not require coaxing, and loss of appetite is often Nature's method of securing a curative fast for some temporary disturbance. If with stomach and liver upset from too much food, coaxing to eat is employed, the result is simply an aggravation of the disturbance. It is a bad plan to have young children at the family table. They are much better with their nurse in the nursery. At the family table there are many things which they should not eat, which they

promptly demand, and which they too often get. Children should be encouraged to drink water, in moderation with meals, and freely between meals. The food should be so ordered that there is always a sufficient amount of hard material at each meal to demand thorough mastication and slow eating. Tea and coffee should not be given to young children.

After the age of five years a more varied dietary is allowed, but the youthful stomach should still be treated with respect, and no excess and nothing indigestible should be allowed.

CHAPTER II

DISEASES OF DIET

RICKETS—SCURVY.

Rickets is one of the commonest diseases of early life. The symptoms may develop at any time from the sixth month to the fourth year, but the majority of cases come under observation between the ninth and twenty-fourth months of life. The term "a rickety child" is popularly applied to one with bony deformities, but although such lesions are common in rickets, they are by no means essential to the clinical picture of the disease. Rickets is to be regarded as a general disease which seems to diminish the resisting power of all the tissues of the body. This diminished resistance may be seen in one patient in the nervous system, as when convulsions occur; in another in the respiratory organs, as shown by bronchitis; in another in the osseous system, as shown by softening of the long bones; and in another in the integumentary system, as shown by the profuse sweating. The general conditions which call for treatment are

diminished resisting power, weakness, and flabbiness. Anaemia is often present. The special affections of the various organs will be considered separately. The disease does not develop acutely, although certain symptoms may. The term "acute rickets" which was current for a time has now fallen into disuse, it having been recognized that the condition so described was really scurvy.

The exact pathology of rickets is still unsettled, but certain factors in its production have been determined. As the result of improper diet, partly by excess, and partly by defect, a certain degree of gastro-intestinal indigestion is induced. This leads to the absorption into the system of certain toxines, either in the form of improperly digested food, or of the products of decomposition of the food, and the blood conveys these toxic products to all parts of the system.

The Preventive Treatment.—The special preventive treatment of rickets lies in the adoption of a proper diet. The conditions in the dietary which lead to rickets are two in number, first, a deficiency in fats, and, secondly, an excess of carbohydrates. These conditions are found most frequently in the artificial foods which are so largely advertised and so largely used for infants. The various forms of condensed milk, when diluted for use, are notoriously deficient in the matter of fat. Also the

tinned starchy foods, whether converted or unconverted, are largely responsible for the production of rickets. They make fat, flabby children, but the fat is of an unhealthy character, and is quite different from the product of a diet rich in animal fat. The physiological needs of infants would be better met by a diminution in the use of "infants' foods," which might be prohibited entirely without any loss to the infantile population. If their use for infants under twelve months of age were allowed only under medical advice there would probably be a great fall in the infantile mortality from rickets in large cities.

Such legislation is not possible at present, but it is at least in the power of medical men to refrain from prescribing these foods as a complete diet for infants, and to use them only as a temporary therapeutic agent. One constantly meets with cases in which months previously a medical man had ordered condensed milk or some patent food, and this had been continued until the symptoms of rickets led the mother to seek medical advice again. It must also be remembered that when a patent food is ordered along with fresh cows' milk, the tendency of the female mind is to regard the food as the essential and strengthening part. The result of this is, that as time goes on the amount of the fresh milk given is not increased and is possibly lessened, while the amount of the patent food is increased. When fresh cows' milk forms

the diet of an infant one must see that it is sufficient in quantity, and that a proper proportion of proteids and fats is present. On a diet of skimmed milk, or separated milk, or buttermilk, rickets will develop unless the fatty element is supplemented in some form.

The question is sometimes raised—and it is a very important one—as to whether an infant, nourished entirely at the breast, ever develops rickets. The answer must be in the affirmative, but with qualifications. If a healthy mother, with plenty of good milk, feeds her infant at regular intervals and uses no other food whatever, then we may safely guarantee that infant freedom from rickets during the normal period of lactation. The cases of rickets in breast-fed infants in the writer's experience have occurred as follows: In some cases there has been too frequent feeding, which resulted in the production of a milk deficient in fat, and as regards the infant in gastro-intestinal catarrh. The milk being poor and the digestion incomplete the conditions for the development of rickets were present. In other cases an excessive amount of unconverted starch, either in the form of thick barley water or of some proprietary food, was given to the infant. Again, lactation may have been carried on beyond the normal period. and the nutriment supplied has been deficient in fat. In some cases, from too frequent child-bearing, the breast milk after two or three months may be

of such inferior quality that rickets develops, These exceptions, however, do not affect the general rule that breast milk is the best food for infants and the best preventive of disease. We can sum up the preventive treatment of rickets as proper feeding, either by the breast or cows' milk, and additional food when called for by the age of the child, care being taken that the fatty element is sufficiently represented, and the carbohydrate element is not over-represented.

The Curative Treatment.—We shall begin with an ordinary case of rickets in an infant of from twelve to eighteen months of age. The first and the most important thing is to restore the stomach and bowels to a healthy condition. A glance at the abdomen is sufficient proof of this. The typical abdomen of rickets is swollen and distended with air; the sides are bulging; the recti muscles are widely separated, and when the child strains the intestines are pushed forward between these muscles in a keel-like protrusion; and the stomach and bowels are dilated and atonic. Further evidences of gastro-intestinal catarrh are often present. The appetite is probably lost or capricious, vomiting occurs, and the motions are loose, frequent and offensive, and mixed with mucus. If a patient in this condition is treated with cream, cod liver oil, and Parrish's syrup much sorrow and tribulation will follow. It is advisable to begin with simple,

plain food in small quantities. A mixture of milk, lime water and thin barley water in equal quantities is to be ordered, of which 4½ ozs. may be taken every three hours during the day. The aim at this time is not to feed up the child, but to rest the stomach and bowels, and allow them to recover their tone. After some days of this dietary, it may be less than a week, or more, according to the conditions present, the strength of the food may be increased by giving equal parts of milk and lime water, and later two parts of milk to one of lime water. If the signs of gastro-intestinal fermentation persist, it is advisable to stop all milk for a few days, and to give only mutton or chicken soup. The child is thus brought into a condition to digest and assimilate the full diet suitable for the disease.

Not only must the digestive organs be allowed to rest at the beginning of treatment, but they must also be thoroughly cleared of the fermenting material which is present. For this purpose nothing acts better than castor oil, as in the following mixture :—

MISTURA OLEI RICINI.

℞. Olei Ricini . . . . . ℥ x
Tincturae Rhei . . . . . ℥ v
Glycerini . . . . . ℥ v
Tragacanthae . . . . . gr. ½
Aquam Menth. Pip. . . . . ad. ℥ i
Sig. ℥ i.—T.D.S. (For an infant of twelve months.)

Although the diet is the most important part in

the treatment of rickets, it must not be thought that there is anything very special or unusual about it. The chief points to be observed are: first, that a sufficient amount of fatty food is given; and, secondly, that no excess of carbohydrates is allowed. Fat may be given as cream, cod liver oil, butter, yolk of egg, dripping, and beef or mutton fat, the chief essential being that it is animal fat. Vegetable or mineral oils do not seem to be nearly so efficacious. Fresh milk is to be regarded as the most important part of the diet during the whole of the rachitic period. Other foods, suitable to the age of the child, are also to be given. Rickety infants have often a great liking for salt, and this probably implies a demand on the part of the organism. One to two drachms of salt may be given daily in the milk. It will also be found beneficial to give them some fresh fruit, such as orange or grape juice, and a small quantity of mashed potato occasionally. These will supply the anti-scorbutic elements, which have often been markedly deficient in the previous diet. This treatment is specially called for in all cases where tenderness of the limbs is present.

A dietary suitable for different ages may be drawn up as follows:—

Between nine and twelve months.—Cows' milk which has been brought to the boil, and slightly sweetened and salted (1 to 1½ pints daily).

Half a teaspoonful of butter or one to two tea-

spoonfuls of cream may be given three to four times a day in milk.

In addition, two meals a day consisting of (1) porridge made with milk, or (2) any plain milk pudding, or (3) boiled bread and milk.

Feed every three hours by day, and only once during the night (10 p.m. to 7 a.m.).

Between twelve and eighteen months.—Milk may be increased to 2 pints daily. In addition, an ounce of cream or the yolk of one egg, or bacon fat, or sardines in oil, daily. Bread and butter.

After eighteen months.—In addition, boiled fish, chicken, or mutton, biscuits, green vegetables. The amount of milk must be lessened when other foods are added, but the fatty material must be in sufficient amount.

General Hygiene.—Sunshine and fresh air are of great value in the treatment of rickets. The child should be out in the open air as much as possible. Except for a few months in summer, the air of towns is neither so full of sunshine nor so pure as country or seaside air. Residence in the country or at the seaside is therefore to be preferred. The night nursery and the day room should always be well ventilated and never overheated. Infants flourish in warmth, but they get depressed and weakened in rooms which are overheated and stuffy. The body clothing of the patients should be warm, light and loose. It is not

advisable to overclothe them in winter, or to dress them in gauzy garments in summer, with the extremities half exposed so as "to harden them," as it is sometimes expressed. Flannel should be worn next the skin during the summer and the winter, the day and the night. A flannel band about the abdomen is also to be recommended, as the organs beneath are specially liable to the effects of external chilling. At night a long flannel nightdress fastened around the neck, and fastened also beyond the feet, will prevent any chilling of the body from the habit of kicking off the bed clothes. When sweating about the head is present, the best plan is to use a firm pillow, as a head bathed in perspiration and sunk in a soft pillow is most uncomfortable. As a rule, with the head resting on a firm pillow the patient will not suffer any inconvenience from the sweating, which subsides as the general treatment is pursued. Warm baths should be given once or twice a day, and this ritual is carried out more thoroughly if some common salt is added to the bath, one tablespoonful to a gallon.

Medicinal Treatment.—This has already been referred to in connexion with the disturbances of the alimentary canal. After the use of castor oil, it may be advisable in some cases to still further improve the condition of the digestive organs. The following prescription will be found useful :—

℞. Tr. Nuc. Vom., ♏ ii ; Tr. Rhei, ♏ v ;
Sodii Sulphocarb., grs. iii ; Tr. Zingib.,
♏ ii ; Aquam ad ℥ i. Sig. ℥ i.—T.D.S.
(For an infant of twelve months.)

As soon as the digestive organs are healthy, cod liver oil should be given. Many infants will take it plain—a half to one drachm thrice daily ; others will prefer it mixed with equal parts of malt extract. Considering the bony and pulmonary complications we prefer an emulsion of cod liver oil with hypophosphites, as in the following prescription :—

EMULSIO MORRHUAE ET HYPOPHOSPHITUM.

℞. Sodii Hypophosph., Calcii Hypophosph.,
āā gr. ½
Olei Morrhuae . . . . . ♏ xxx
Olei Cassiae . . . . . ♏ 1/10
Glycerini . . . . . ♏ vi
Tragacanthae . . . . . q.s.
Aquam Destill. ad . . . . . ℥ i
Sig. ℥ i.—T.D.S.

As this is not easily dispensed, unless made up in bulk with care,[1] one of the good emulsions on the market may be ordered. They differ chiefly in the flavouring used. Cod liver oil in one or other of the above forms should be administered continuously for some months. After the age of two years the dose may be increased gradually up to six drachms daily.

[1] An elegant preparation according to the above formula is made by Mr. George Lapthorn, Chemist, Abbey Road, London, N.W.

Special Rickety Manifestations.—It is important to remember that certain symptoms and certain affections have a rachitic background. Some of them are peculiar to rickets, others are very frequently found in association with rickets. In both cases complete treatment implies not only relief of the immediate symptoms, but also the employment of a full anti-rachitic treatment as described above.

1. Pulmonary Complications.—Bronchitis is one of these affections. Rickety children are extremely liable to bronchitis. In some this will be found associated with obstruction in the naso-pharynx from adenoid hypertrophy. This obstruction should be removed. In others the hygienic surroundings are bad, and must be looked to. The error may be found in hot stuffy rooms, or in improper clothing. In others an excess of adipose tissue is present, probably from an excess of carbohydrate food. In over fat babies the peripheral resistance to the flow of blood is very great, and a congested state of the bronchial tubes is common. A slight cold spreads rapidly to the bronchi, and in many cases the patient is never free from chronic bronchitis. This condition is much improved by reducing the weight. A rigid dietary is to be employed, in which the carbohydrates are reduced to a minimum, and proteids and animal fats are used in strict moderation for a time. The flabby

fatty tissue will melt away, and will be replaced by a firmer tissue, less bulky and less obstructive to the circulation. In all cases, the use of anti-rachitic remedies will do more good in curing the bronchitis than any special measures directed towards the lungs. The treatment for acute attacks will be discussed in the section on bronchitis. Broncho-pneumonia is another common pulmonary disease of great gravity in rickety infants, and while special measures are called for during the acute stage, the treatment of the constitutional disease must be kept in mind (*vide* Broncho-pneumonia).

2. Intestinal Complications.—Diarrhoea is a common trouble both in summer and winter, but is more dangerous during the former season. An acute attack may be precipitated by over-feeding, or improper feeding, or a chill, or other simple cause. The treatment during the acute stage is on general lines, but one should not trust too much to sedative measures in the convalescent or chronic stage. Starvation, and medicines like bismuth, castor oil, etc., are all very well for a time, but what the patient really wants is treatment for the rickets. Fats and cod liver oil should be given as early as possible, in small doses at first, and it will often be found that the catarrh and diarrhoea are checked more efficiently by this means. In summer weather the purity of the food must be specially attended

to in rickety children, owing to this tendency to diarrhoea, and if possible they should be sent out of town. If the milk is not absolutely fresh and sound, it may be advisable to use condensed milk as a temporary measure.

3. Nervous Complications.—Certain nervous disturbances common in rickets call for notice, namely convulsions, laryngismus and tetany. They are intermittent in character, and come and go on apparently slight provocation, owing to the fact that the underlying cause is not cerebral disease, but nervous debility from rickets. "Laryngismus stridulus, tetany, and general convulsions are the positive, comparative, and superlative of the convulsive state in children" (Cheadle).

Convulsions are of common occurrence. The immediate exciting cause is some form of peripheral irritation, which may take the form of the cutting of a tooth, of an overloaded stomach, or of intestinal disturbance. The immediate treatment is discussed elsewhere (*vide* Convulsions), but the recognition of the underlying rickets should lead to treatment which will diminish the frequency of the attacks and ultimately cure the nervous instability.

Laryngismus stridulus, or "child crowing," is another of the nervous manifestations. This is one of the phenomena peculiar to rickets. It may take

the form of acute attacks, coming on suddenly in the day or the night, and accompanied by a considerable degree of distress from the obstruction of the breathing. In other cases, the condition is chronic, and apart from the noise produced, there is nothing to suggest any distress or discomfort. As the condition is one of spasm of the vocal cords, and not of catarrh, measures such as steam kettles are not called for. One will often find that a change from a stuffy atmosphere to fresh cool air leads to a sudden cessation of an attack. Plenty of fresh air is therefore of the first importance. In an acute case, a dose of castor oil, 1 to 2 drachms, should be given. A dose of chloral hydrate (2 to 4 grains) and of bromide of potassium (5 to 10 grains) should be given at bedtime, and can be repeated during the night if necessary. On the occurrence of an acute attack a hot fomentation may be applied round the neck, and if this does not relieve the child, a hot pack may be given. A hot pack consists of a blanket wrung out of boiling water and wrapped round the child as hot as the skin will tolerate. Round this, one or two dry blankets are wrapped. The child lies in this for ten or twenty minutes, and when the skin acts well, the blankets are removed and a dry hot one is wrapped round the child. Sleep and relief from the spasm usually follow, the whole process is soothing, and there is little disturbance of the child involved. In cases associated with an overloaded stomach, an emetic such as

sulphate of copper, 1 to 2 grains in 1 drachı water, will often check the attack. It is very rı that death occurs from spasm of the glottis, but possibility of such an occurrence must be kep mind, and the acute attacks relieved as quickl possible. In all cases the employment of ı rachitic treatment will in time remove the trou

Tetany is a peculiar and painful spasm of muscles of the hands and feet, accompanied o by oedema. The attacks are usually of short d tion, but tend to recur. In the presence of suc condition one has to pay special attention to state of the alimentary tract. Gastric and intest catarrh is usually present, and dilatation of stomach and bowels is often marked; in short, "pot-belly" of rickets will be well shown. T condition of atonic dilatation must be treated b spare diet, by the use of non-fermentative foc and by evacuants. The quantity of fatty ı farinaceous foods must be cut down. Small dc of grey powder (½ grain) with sulphocarbolate soda (3 grains) should be given three times a d to improve the tone of the stomach and bow and as anti-fermentatives. If more thorou cleansing of the bowel is necessary, as shown the presence of diarrhoea and undigested motio the *mistura ricini* should be used. The abdon should be supported by a firm flannel bandage, a abdominal massage may be employed once or tw

a day for five minutes at a time. The hands and feet should be wrapped in cotton wool. If signs of nervous irritability are present, one can give chloral and bromide, but as a rule these are not necessary in ordinary cases.

4. Bony, Muscular, and Ligamentous Affections.—Changes in the bones, muscles and ligaments are amongst the most marked phenomena of rickets. The bones are soft and bend easily, the muscles are weak and flabby, and the ligaments stretch readily and fail to give proper support. The bony changes in the skull indicate the need for anti-rachitic, but not for special treatment. An antero-posterior curvature of the **spine** in the dorso-lumbar region is common, and is due more especially to muscular and ligamentous weakness in the back, and inability to support the weight of the head. In such cases standing and sitting must be stopped. The child must be kept lying down night and day. For day use a well-padded board may be prepared, on which the child lies at full length when in the perambulator, or in the garden. Shoulder straps can, if necessary, be fixed on this, which will allow of the free use of the upper and lower extremities. Massage of all the back muscles should be carried out thoroughly twice a day, and cold douching or spraying of the back is also useful if the child is over eighteen months. Before that age it is too terrifying a process to be advised.

Fresh air, sunlight and a full anti-rachitic dietary are of the greatest importance, and although a complete cure will follow, patience and time are indispensable, for the process of recovery is slow. The **ribs** show great softening in rickets, and as the result are apt to be much distorted from atmospheric pressure. The sinking in of the ribs also causes diminished respiratory power and space, and is often a factor in inducing serious pulmonary complications. While it is difficult to employ ordinary massage to the small chest of an infant, friction with a stimulating liniment does good. For this purpose the following may be used :—

℞. Linim. Belladonnae, Linim. Terebinth. Acet., Olei Dulcis, āā ʒ i. Sig.—To be rubbed on to the chest twice daily.

In these cases one observes a marked sinking in of the costal parietes during inspiration, and exaggerated diaphragmatic breathing. An effort may be made to increase the power of the costal muscles in inspiration by applying a bandage tightly round the abdomen for half an hour or an hour at a time. This, by impeding the action of the diaphragm, will make the child use the thoracic muscles as much as possible. The patient must be carefully watched so as to prevent dyspnoea—from too much work being thrown on the weakened muscles. The **lower extremities** are a source of much trouble in

rickets. According to the severity of the affection and the date of onset, a rachitic child may not be able to stand or walk at the usual age ; may not be able to walk at all until two or three years old may have learned to walk and then " go off its legs " entirely ; or may in the process of walking develop knock-knees, bow legs, coxa vara, and many other bony deformities. These conditions are all preventable, and in the early stages are all curable. If the deformities arising in the softened bones are allowed to increase and to persist until the bones begin to harden—say, after the age of four years—they will not be amenable to medical treatment. The difficulty in using the lower extremities may be due to weakness of the muscles, or to weakness of the ligaments, or to softening of the bones, or to several of these factors in combination. In the earlier years it is wonderful what a power nature has in removing deformities if she is only given an opportunity. The first essential in the treatment of rachitic weakness in the lower extremities is to take the child off his legs. He is not to be encouraged to use the legs, with a view to strengthening them, as is sometimes done. If he shows a disinclination to walk, or if he has lost the power of walking, or if the bones are beginning to bend, he must not be allowed to bear any weight on the lower extremities. Sometimes it is advisable to reduce the weight of the super-structure, as in the case of over-fat children, for the fatter the child

the greater will be the tendency of the leg-bones to yield. The patient, therefore, must not be allowed to rest his weight on the lower limbs for a month, or three months, or six months even, according to the severity of the case. In the house he can sit up, or lie on a couch, well propped up, and he can be out in the open air in the same positions. If he is under close observation, it may not be necessary to use splints, but in cases where children are left alone it is absolutely necessary to prevent the use of the limbs by means of splints. These should be well padded, and extend from the middle of the thigh to some 6 or 8 inches beyond the foot.

Opinions differ as to the use of splints at night, but considering the way in which these patients often flex the lower extremities on the abdomen during sleep, the employment of splints is probably quite as serviceable at night as during the day. Attention must also be paid to the muscles and ligaments of the lower extremities, which are already weakened, and under the rest treatment will tend to get more so. Bathing with salt water and douching the limbs with the same—hot in the case of babies, and cold in older children—are useful. Thorough massage of the muscles, along with bending of all the joints, should be persevered with regularly. With the child lying on his back, he may be encouraged to move about the limbs to his heart's content. When these precautions have not been taken, and the bones have become hardened

in deformed positions, the only available treatment is surgical.

Scurvy.—It is found that over 75 per cent. of the cases of scurvy occurring during the whole period of childhood arise between the sixth and twenty-fourth months, and hence the term "infantile scurvy" is fully justified. The leading feature in connexion with scurvy is haemorrhage. This may take the form of bleeding at and around the epiphyses of the long bones, producing a painful, tense, subperiosteal swelling. Haematuria may be the only sign, and this is specially apt to occur in the case of infants under twelve months. Bleeding and sponginess of the gums may be present after the period of dentition has begun. Haemorrhage may occur about the orbit, in the skin, from the nose, or from the bowel. The patients are usually anaemic—sometimes markedly so—and the bloodlessness is aggravated by extensive haemorrhages, such as those in connexion with the long bones. The infants are frequently very listless and apathetic, show a disinclination to move the limbs actively, and sometimes develop a condition of pseudo-paralysis in the limbs affected. The following facts in connexion with the etiology of scurvy may be borne in mind: (1) Scurvy is a disease of defect, not of excess. (2) The defect consists in the absence from the diet for a prolonged period of a sufficient amount of the anti-scorbutic element in

food. (3) Although the exact element is not known, the foods which contain it are known. (4) The anti-scorbutic element is found most abundantly in fresh or living food, more especially in fruits and vegetables, and the further we get from fresh food as the regular diet, the greater is the tendency to scurvy. (5) There is a class of prepared foods for infants (tinned foods, "proprietary foods," "infants' foods") in which, during the process of preparation, the anti-scorbutic element has been entirely destroyed.

The **preventive treatment of scurvy** may be briefly summed up as the employment of a fresh food diet, suitable in quantity and quality to the age of the child. This has already been described (*see* Chapter I). Cows' milk must be fresh, and must not be altered by prolonged boiling or pasteurizing. Many cases of scurvy have been traced to the use of sterilized or pasteurized milk. This risk has recently been increased by the action of several of the large dairy companies, which are supplying pasteurized milk to all their customers, without any intimation that the milk has been so treated. As many of the customers proceed to boil the milk on delivery, the vital element in it will be in an extremely attenuated condition by the time the milk reaches the infant. The custom referred to is a recent one, but Dr. Coutts has already recorded a case of an infant suffering from scurvy who failed

to improve on the dairy milk supplied. It was then discovered that this milk had been pasteurized, and on changing to fresh cows' milk, rapid improvement took place. Cases have also been traced to the use of milk from municipal dépôts, where undoubtedly the milk had been treated in some injurious way. While the risk of scurvy is increased by prolonged pasteurizing or sterilizing, the domestic method of boiling the milk for a few minutes, or scalding it, is probably harmless. Sometimes over-dilution of the milk leads to scurvy. It is said that a quart of milk contains as much citric acid as an orange, and this citric acid is looked on by many as the anti-scorbutic element. But if an infant receives only one-quarter or one-half of a pint of milk daily, the amount of anti-scorbutic material may be so small that scurvy develops. It is therefore necessary to see that there is a sufficient quantity of fresh milk in the dietary—namely, 1 to 2 pints daily. Another curious fact about scurvy is that it often develops as the result of the prolonged use of some special food ordered for the cure of another disease or disorder. Thus, owing to indigestion of some form, an infant may have been put on peptonized milk, and after some months of this diet scurvy is produced. Or some kind of condensed milk has been prescribed for gastro-intestinal disturbance, and after some months scurvy appears. It must be remembered that predigested milk and condensed milk are liable to induce scurvy

if employed as the sole diet for any length of time.

The direct connexion between the employment of a diet consisting of condensed milk or other patent "infants' food," and the subsequent appearance of scurvy, has led all writers on the subject to regard such a diet as the chief cause of scurvy. Some of these foods are more frequently associated with scurvy than others, but this pre-eminence is due (1) to the larger sale of the food, or (2) to its use during the earliest months of life, or (3) to its exclusive use without the addition of any fresh milk. It is daily becoming clearer that these artificially prepared and preserved foods are not to be depended on in the feeding of infants, and in the preventive treatment of scurvy they must be abolished entirely from the diet, as it is practically impossible to confine their use within safe limits. After the age of two years scurvy becomes much less common because fruit and vegetables almost invariably form part of the diet. In rare cases one finds that there is a positive dislike to fruit and vegetables in any form, and in the absence of any anti-scorbutic material in the diet, scurvy may appear. In such cases the special dislike must be overcome by firm treatment.

The **curative treatment** proceeds on the same lines as the preventive. In the case of infants fresh milk is to be given, and in order to secure

the most prompt effect, it should not be treated by heat in any way. Raw meat juice has been recommended by Dr. Cheadle and Sir Thomas Barlow for the anaemia which is usually present. It is not of great anti-scorbutic value, as meat is used in this country, but is easily retained and digested. For an infant of twelve months, half an ounce of expressed meat juice may be given daily, in divided amounts, and well diluted with milk or water. The more special part of the dietetic treatment consists in the free administration of fresh fruits and vegetables. The full list of these is a large one, but the following will be found the most useful, namely—oranges, lemons, grapes, potatoes, and cabbages. In the case of infants under one year, the juice of oranges or grapes may be expressed, and half an ounce may be given in water three times a day. In older infants, boiled and sieved potato, mixed with milk, is a most effective anti-scorbutic. Dr. Hutchison recommends that the potato should be boiled in its skin, and that the floury part just beneath the skin should be used, as this is richest in potash salts. Another plan, suited to those with weak digestive powers, is to administer the vegetable juices through the medium of beef tea or chicken tea, in which potatoes and carrots have been boiled and strained off (Cheadle).

Care must be taken that the amount of fruit or vegetables is not in excess of the infant's digestive powers, in which case sickness, flatulence,

diarrhoea, etc., may follow and interfere with the recovery.

The effect of this special treatment is one of the most striking in medical therapeutics. Improvement is often noted within a couple of days, and recovery from acute manifestations within a week, provided that the disease has not progressed too far. The child begins to brighten, milk is taken with avidity and relish, the haemorrhages cease, the swelling of the gums subsides, the tenderness in the limbs becomes less marked, and there is not that look of anxiety, from fear of movement, on the approach of an attendant.

As regards medicines, most of them are of no special value, and some are distinctly injurious. Owing to a mistaken diagnosis of syphilis, mercury has frequently been employed, and has undoubtedly done harm. Iron tonics and haemostatics are not called for if the dietetic treatment is thoroughly carried out. Rickets is frequently present along with scurvy, and the former may be evidenced by gastric catarrh, bronchitis, etc., which call for careful treatment. Great prostration must be combated by the use of stimulants, of which brandy and strychnine are the most useful. If much pain is present, small doses of opium may be given to secure rest and sleep. Five minims of paregoric or half-minim doses of nepenthe may be given occasionally until relief is secured. Complete rest in bed must be enforced during the active stage, both

for the prevention of suffering and in order to avoid the risk of cardiac syncope. In cases with extensive subperiosteal effusion of the extremities, the limbs must be wrapped in cotton wool, and handled very carefully, as fractures are apt to occur.

CHAPTER III

DISEASES OF THE ALIMENTARY SYSTEM

THRUSH—ULCERATIVE STOMATITIS—DISORDERS OF DENTITION—TONSILLITIS—PHARYNGEAL ABSCESS—DISORDERS OF THE STOMACH—CHRONIC GASTRO-INTESTINAL CATARRH—ACIDOSIS.

Thrush is due to a parasitic growth (*oidium albicans*) occurring in white patches on the mucous surfaces of the mouth and tongue in debilitated infants. It is to be regarded as an indication of the profound state of exhaustion into which the patient has fallen rather than as a disease. The important part of the treatment is therefore to build up the general health as quickly as possible, and to treat any underlying disease. Stimulants such as brandy are useful, and tonics such as quinine and strychnine. When the tissues are restored to a healthy condition the thrush will soon disappear. To expedite matters, and to prevent the extension of the trouble, the mouth should be cleaned carefully after each feed with a warm bicarbonate of soda solution (grs. v. to the ounce). This will

remove some of the thrush and all loose particles of milk, etc. The mouth should then be painted or rubbed over with glycerine of borax or mel boracis. By this means the patches of thrush which are often very adherent will be gradually removed. In this and in all other infective diseases of the mouth it is very important that all the feeders should be scrupulously clean, and that no "comforters" be allowed, as they are simply disease carriers.

Ulcerative Stomatitis is a common affection in children, and occurs most frequently after some teeth have been cut. It would appear to be an infectious disorder, as several members of the same family are often affected at same time. The ulceration, at first patchy and around the teeth, tends to spread to the tongue, and to the mucous surfaces of the cheeks. Larger patches of ulceration may be formed by the coalescence of smaller ones. The mouth is extremely tender, the teeth are often loose, the salivation is profuse, and the breath is most offensive. The ulceration may extend as far as the tonsils. Any source of infection about the house should be looked for and removed, and any habits which may have led to the direct transference of the poison to the mouth must be corrected. The diet should be such as not to irritate the mouth, which is extremely sensitive. Milk, milk gruel, and boiled bread and milk are

sufficient during the acute stage. One grain of calomel on three successive nights, followed by a dose of saline in the morning, will help in relieving both the constitutional disturbance and the local condition. The most useful drug is chlorate of potash, which may almost be regarded as a specific. If used locally it causes extreme pain, and does not do so much good as taken internally. It appears to be aided in its action by iron as in the following formula :—

℞. Potass. Chlorat., grs. ii ; Liq. Ferri Perchlor., ℥ iv ; Syrupi Simplicis, ℥ x ; Aq. Destill. ad ℥ i.

One drachm may be given thrice daily to an infant of twelve months, and two drachms to a child of five years. This medicine ought to be given in milk or with barley water so as not to cause pain in the mouth. Local treatment does not appear to be really necessary, apart from a mouth wash of Condy's fluid and water, or Sanitas and water. In severe ulcerative cases local treatment may be found advisable to check the extension of the disease. In such cases the following lotion is both sedative and antiseptic :—

℞. Liq. Hydrarg. Perchlor., ʒ iss ; Boroglyceride, ʒ ii ; Glycerini, ʒ i ; Aquam ad ʒ iv. Sig.—To be painted on thrice daily.

The acute condition will usually yield to treatment in three or four days, and the whole attack will probably be over in a week. The chlorate of potash should not be continued longer than is necessary owing to its depressing effect, but the iron may be given for another week. After a cure has been effected the teeth should be examined by a dentist, who will probably find some carious teeth which require treatment, in order to maintain a healthy condition of the gums and prevent further infection. Ulceration of the gums is sometimes associated with scurvy, but the great swelling and sponginess in the latter affection show that something more than simple ulceration is present.

Disorders of Dentition. — The process of dentition in a healthy infant who is properly fed is seldom, if ever, more than the cause of slight temporary discomfort. In weakly infants, however, and in those who are improperly fed, many disturbances are apt to be present during the period of dentition. These are not necessarily due to "cutting the teeth." An eight-months old infant begins to get "fretty" and its cry is interpreted as implying hunger. Food and feeding times are increased until stomach and bowels are completely upset, and then the doctor is called in to confirm the diagnosis of teething and to lance the gums. Or it may be that at the teething time an infant has been weaned and cows' milk and solid food

have been given. A certain amount of gastro-intestinal disturbance follows, and again the diagnosis is teething. Many other illustrations of the so-called "disorders of dentition" might be given, which all point to the important rule, that one should never ascribe an illness to teething until other sources of disturbance have been excluded by a careful examination. The cause of the child's illness may be found in the ear, the throat, the lungs, the brain, etc., but most frequently it is in the alimentary canal. Dr. Leonard Guthrie says: "The mouth is part of the alimentary tract, and the teeth and gums are part of the mouth, and therefore share in the general disturbance caused by indigestible and irritant matter in the intestines."

It is never advisable to make a diagnosis of teething disorder unless there are definite objective signs about the gums. If they are swollen, inflamed, tender, dry, and hot, one may naturally conclude that they are a source of discomfort to the infant. Even in such cases it is doubtful whether the teeth are the cause of the trouble. Certainly, in many cases, one can bring the gums into a healthy condition without the eruption of a tooth taking place. Swollen gums do not always mean a teething process, and acute gingivitis is more frequently the result of some local infective disorder.

In all disorders which are popularly ascribed to

teething, the first part of the **treatment** is to leave the teeth severely alone. Dietetic errors and gastro-intestinal symptoms should be looked out for and treated. Rickety children are supposed to be specially liable to teething disorders, but here also the teeth are probably less to blame than the stomach and bowels. If one has excluded any definite disease outside the alimentary system, the following lines of treatment may be adopted. For a few days the diet should be reduced by one half, and should consist of equal parts of milk, lime water and barley water. Two grains of grey powder or one grain of calomel may be given to an infant nine months old, and this may be followed by the *mistura ricini*, 1 drachm thrice daily. If much restlessness is present, 3 or 4 grains of bromide of ammonium may be added to each dose. Great attention should be paid to the disinfection and cleanliness of the mouth. After each feed the mouth should be thoroughly cleansed with hot boracic lotion and cotton wool. Dr. Eustace Smith recommends that the swollen and inflamed gums be rubbed with lemon juice, which causes some smarting at first, but afterwards has a sedative effect. Should the gums be lanced? Lancing will have no effect in bringing on the teeth, and will only relieve symptoms by the process of blood-letting. If the practitioner cannot procure rest to the child by other means, he may be justified in incising the gums, but it is a proceeding which is

very seldom called for, and it is not without danger, as septic infection may follow. We should advise rather 5 minims of paregoric for the relief of pain. Sometimes advice is sought because teething is delayed beyond the normal period. In such cases, if the delay is real, the child should be examined as to its general condition, and some accompanying disease will usually be found. The most common causes are rickets and defective cerebral development.

Tonsillitis is a very common affection in children. One attack seems to predispose to another, and the result of repeated attacks is a chronic enlargement of the tonsils. The affection is usually pyrexial, and frequently a temperature of 103° or 104° F. may be the only sign of disease. The child may complain of no pain and of no difficulty in swallowing, and unless one remembers that tonsillitis is frequently a cause of pyrexia, the condition may be entirely overlooked. The association of tonsillitis with many of the eruptive fevers is so marked, that it is advisable in every case of sore throat to examine for a rash, and in every case of a doubtful rash to examine for tonsillitis. An attack of tonsillitis is often rheumatic in origin, and unless the nature of this form is recognized, very serious results may follow. Although the associations of tonsillitis are numerous, it is impossible to differentiate them from the appearance of the tonsillar

inflammation. The common distinction to be made is between acute tonsillitis and acute follicular tonsillitis.

Acute Tonsillitis is usually the result of some infection from without. One tonsil may be involved at first, and later the other. The attack lasts for from three to seven days. The patient should be kept in bed during the whole of the pyrexial stage, and for some days longer in cold weather. The diet should consist of milk and barley water, milk gruel, boiled bread and milk, and simple milk puddings. It will sometimes be found that milk thickened with solids is swallowed more easily than the plain fluid. A sharp mercurial purge should be given at the outset, 2 or 3 grains of calomel at night, and 2 drachms of sulphate of soda or magnesia in the morning. This treatment, in half doses, may be repeated with benefit on the two following nights. If much pain is present, or much glandular swelling in the neck, the use of intermittent hot fomentations or poultices will give relief. In older children cold applications may be used instead of hot. Gargles and sprays are not suitable for use in childhood, and it is doubtful whether painting the tonsils is of much benefit in simple tonsillitis. For the relief of pain, glycerine or bismuth lozenges may be used. Whether the tonsillitis is rheumatic or not, the following medicine acts beneficially, and should be given throughout the acute stage :—

℞. Sodii Salicyl., grs. v ; Sodii Bicarb., grs. x ; Syr. Zingib., ℥ iii ; Aquam ad ℥ i—
T.D.S., vel quartis horis.

Follicular Tonsillitis, or "ulcerated sore throat," is a form of tonsillitis in which the follicles are specially involved. The inflammatory products are exuded, and appear as small yellowish-white specks on one or both tonsils. Later, these specks may increase and coalesce to form large, soft patches, covering a large part or the whole of the tonsil. The condition may often be difficult to distinguish from diphtheritic tonsillitis. The exudation in the former is usually yellower in colour, softer in consistency, and can be stripped off more readily. Further, in the former the fever is higher, the illness develops more acutely, and the patient at an early stage looks more severely ill than in diphtheria. The treatment consists of rest in bed, simple diet, and purgatives, as in acute tonsillitis. Chlorate of potash and iron should be administered in full doses as follows :—

℞. Potassii Chloratis, grs. ii ; Liq. Ferri. Perchloridi, ℥ iv ; Aquae Chloroformi, ℥ xxx ; Syrupi, ℥ v ; Aquam Destillatam ad ℥ i. Sig.—℥ i to ℥ ii every four hours according to age.

After two days the frequency may be reduced to three times daily. Local disinfection of the throat

should also be carried out by means of some lotion, such as the following :—

> Liquor Hydr. Perchlor., ℥ iss ; Boro-glyceride, ʒ ii ; Glycerini, ℥ ii ; Aq. ad ℥ iv. Sig.—To be painted on the throat thrice daily.

Rheumatic Tonsillitis is usually to be diagnosed from the presence of other signs of rheumatism, or from the persistence of the tonsillitis. Pain on swallowing is usually a prominent symptom, and there may be some stiffness of the neck, or pains about the legs, or a valvular murmur. When a simple tonsillitis does not yield to treatment, and the temperature persists, rheumatic tonsillitis should be suspected, and suitable treatment adopted (*vide* Rheumatism).

The treatment of chronic enlargement of the tonsils will be discussed later in connexion with the subject of post-nasal adenoid hypertrophy.

Suppuration—peri-tonsillar abscess—does not occur nearly so frequently in connexion with the acute tonsillitis of childhood as in adult life. The treatment is the same, viz. as soon as the presence of pus is diagnosed, to use a knife or sharp sinus forceps for its evacuation. There may be great glandular enlargement in the neck in connexion with acute tonsillitis. In childhood, suppurative adenitis—the result of tonsillitis—is very common,

much more so than in adult life. When one more glands have suppurated, the only treatmen by operation.

Pharyngeal Abscess.—This is a not uncomm affection during the first year of life, and m seriously imperil an infant's life if not diagnos in time. It is due to inflammation and suppu tion in the post-pharyngeal lymph gland or glan The abscess may be limited to the region of t pharynx, and is usually situated laterally ratl than centrally. In other cases the abscess sprea into the surrounding tissues and may cause swelling in the side of the neck. A rarer conditi of pharyngeal abscess is that associated with spi caries, of which it is sometimes a complication, a calls for special surgical treatment. The ordina abscess is usually the result of some local infecti disorder, often slight, so that the patient may r come under observation until the symptoms due the abscess have caused alarm. These sympto are due to the obstruction caused by the bulgi abscess. Swallowing is interfered with. Respirati is impeded, and in addition to dyspnoea attac of cyanosis may occur. The spluttering charac of the breathing is usually diagnostic. Ev apart from the urgent attacks of dyspnoea, o can see that the breathing is obstructed, a from the absence of any special nasal sniffli or laryngeal stridor, one can usually ident

the throaty breathing as due to pharyngeal obstruction. Much mucus is secreted and may be poured out freely from the infant's mouth.

The only **treatment** is to open the abscess as soon as possible. In the slighter forms in which the abscess is localized in the back of the pharynx, the opening can be made through the wall of the pharynx with a knife covered with some protective except at the point. The child's head should be in a dependent position so as to prevent the pus passing into the larynx. Emmet Holt uses his finger nail to open the abscess, but this method is perhaps better reserved for cases of extreme urgency. Rapid recovery usually follows the evacuation of the pus.

The more extensive forms of pharyngeal abscess in which the pus has burrowed into the cervical tissues are to be opened externally under the usual surgical precautions, and drained.

Disorders of the Stomach—On entering on the subject of affections of the stomach and bowels in early life it may be stated at once that the great majority of these are distinctly dependent on the diet and the feeding. They are therefore preventable by the use of proper foods, properly administered. They are to be treated by giving rest temporarily to the digestive organs, and then gradually working up to a proper dietary as the disturbed organs recover their tone. These facts

are well known to all who practice amongst children, but it is safe to say that they will not be recognized by the majority of parents in this generation. The general principle to be followed in connexion with the treatment of the various symptoms of indigestion, namely vomiting, flatulence, colic, diarrhoea, and constipation, is to attend first of all to the diet. No one will deny that there is such a thing as idiosyncrasy as regards diet in infancy, but the cases are far fewer than is commonly believed. The stomach of most infants and children is quite capable of dealing with ordinary food, and the common forms of indigestion are not due to hereditary tendencies or acquired diseases but to improper feeding. In the following pages it will not be necessary to split up the disturbances of digestion into a large variety of ailments, and we shall consider only the temporary measures needed to restore peace before a full physiological diet can be used. The treatment of certain diseases of the stomach and bowels will be specially considered.

The stomach is the source of much trouble in infancy, and the leading symptoms of disturbance there are vomiting and flatulence. The belching of wind and the regurgitation of food are not necessary post-prandial sequelae during infancy, although many nurses hold a contrary opinion. Such errors as too rapid or too frequent feeding, which are apt to induce vomiting, must be corrected. The regular regurgitation of food after a meal implies that too

much has been taken, and that the stomach has been over-filled. If this is allowed to become habitual, dilatation of the stomach will follow. The treatment should be to reduce the amount given at each meal.

When vomiting occurs an hour or two after a meal it is probably due to incomplete digestion of the food, which is refused exit by the pylorus. This is a condition which, if it becomes chronic, is apt to be accompanied by pain, flatulence and wasting. The fault may lie in the nature of the food or possibly in some idiosyncrasy in the infant's stomach. With these evidences of gastric trouble, which is often called gastritis or gastric catarrh, it is essential to find out the cause. In the case of breast-fed infants this may entail an examination of (1) the mother, (2) the breast milk, and (3) the child.

(1) It is but too common to find that a woman who does not habitually take alcohol will consume a couple of pints of beer or stout daily when she is nursing, in the belief that she thereby increases her nursing power. My own experience has been that alcohol is of no value as a milk producer in women, and that it may lead to indigestion in the infant. The substitution of cows' milk for alcohol will often enable the infant to digest the breast milk satisfactorily. If the mother is leading too strenuous a life, as represented in the upper classes by social gaieties, and in the lower by severe physical labour, the milk may be so altered as to become indigestible.

The habits and diet of the mother must be carefully regulated.

(2) An examination of the breast-milk may show that it is too rich in proteids, in which case Dr. Eustace Smith recommends plenty of farinaceous and vegetable food for the mother, and a few ounces of barley water for the infant before taking the breast. If the milk is too rich in fat a distinct diminution in the amount of food taken by the mother is indicated. In somewhat rare instances the gastric trouble arises from an unusually large size of the fat globules, a fault which cannot be remedied.

(3) An examination of the infant is always called for in order to find out whether there is any local or constitutional disease present which is the cause of the gastric symptoms.

As regards bottle-fed infants one must inquire into the quantity and quality of the meals and the frequency of the feeding times. In many cases when these are properly regulated the stomach disturbance will cease. A common fault is to give the milk too concentrated. The use of improperly prepared barley water is a frequent cause of gastric disturbance. In some cases whole barley is used and boiled down into a thick mass which is added to the milk. In other cases ground barley is boiled and added to the milk. Both these methods are unsuited for infants under the age of nine months, who cannot digest a quantity of unconverted starch.

The barley will not only remain undigested itself but will cause so much gastric disturbance as to interfere with the digestion of the milk. The use of tinned foods and "infants' foods" is also a common cause of gastric trouble, although as a rule they are more apt to induce intestinal indigestion. Reference may also be made to the habit in certain classes of giving young infants a taste of what is going at the family table, some potato, or sausage, or a drop of beer. This method of feeding must be put a stop to.

In other cases it will be found that neither a cessation of improper feeding nor a return to physiological feeding will relieve the gastric symptoms. Other measures will then be called for and will be discussed in the chapter on chronic gastro-intestinal indigestion.

In children over two years of age acute gastric catarrh is usually traceable to some error in diet. This may take the form of a surfeit of raw apples, ice-cream, strawberries, pineapple, sweets, etc.—one cannot tell what the vagaries of a boy's appetite may be. As a rule the first symptom is pain, and vomiting follows. From the nature of the vomited material it is often possible to tell what the cause of the disturbance is. If vomiting does not afford relief it is advisable to give an emetic of sulphate of copper (grs. ii. in half an ounce of water) so as to empty the stomach thoroughly. The stomach should then be rested by a total abstinence from

food for twelve hours, only sips of hot water being allowed. Rest in bed and hot fomentations to the abdomen will complete the cure. Food should be resumed in small quantities at first, and should consist of some light chicken or mutton soup.

In other cases an attack of acute gastric catarrh may be induced by a severe chill. This may be due to a wetting, or cold feet, or some prolonged exposure. The temperature may rise to 103° or 104° F., and the child may look very ill. All appetite is lost, digestion is much weakened, and any strong food leads to vomiting. In the acute stage it is not advisable to give much food, as it will simply increase the gastric disturbance. Peptonized milk, albumin water, weak chicken or veal soup may be given in feeds of three or four ounces at a time. If these are not retained then champagne (half an ounce every four hours), and sips of hot water should be given for a time. Rectal feeding is rarely called for as the disturbance is only temporary. Hot fomentations may be applied to the abdomen. A sedative mixture will be found useful in the early stages, such as the following :—

℞. Liq. Opii sedativi, ℥ i ; Ac. Hydrocyanici diluti, ℥ ½ ; Inf. Gentianae compositi, ℥ xv ; Aq. Chloroformi, ad ʒ i.—T.D.S.

Chronic Intestinal Indigestion. — (Syn. Chronic gastro-intestinal catarrh. Chronic indigestion. Marasmus.) We pass from the more acute

disturbances of the stomach to those more chronic affections in which the functions of the stomach and bowels are interfered with. In many cases the correction of errors in diet will serve to restore the disordered functions. In others one has to employ for a time a special diet, suited to the individual case, in order first of all to rest the stomach and bowels and allow of the gradual recovery of the disordered secretions.

1. In Infancy. — In the case of breast-fed infants chronic gastro-intestinal indigestion is not common, save from gross neglect of the rules of feeding. In the case of bottle-fed babies the condition is an extremely common one, and may call for much skill and patience in treatment. The great cause of chronic indigestion in babies is over-feeding. Whenever the infant cries the tendency is to assume that he is hungry and to give more food. The very temporary relief produced by this is soon followed by more discomfort, more crying, and more food. Even if the food is vomited, it is thought that the loss must be made up, and so more food is given. The marvel is not that the child does not thrive, but that he manages to survive. Sooner or later the overtaxed digestive powers break down. The infant wastes, becomes restless and peevish, and sleeps badly. Colicky pains, vomiting, flatulence, diarrhoea or constipation, and offensive motions with mucus or undigested milk are common accompaniments.

One must make a thorough inquiry into the history of the past feeding. The freshness of the milk, the cleanliness of the feeding bottles, the amount of diluent, cream, and sugar used, the temperature of the milk, the frequency of the meals, the time spent at a meal, the state of the appetite —all these points must be inquired into so as to detect any fault which may have originated or maintained the indigestion. One of the most prolific sources of intestinal trouble in infancy is the use of condensed milk and proprietary "infants' foods." These foods are easily prepared, do not quickly go bad, and "stay down" as a rule without much difficulty, so that by a large number of ignorant mothers they are preferred to fresh foods. The infants apparently thrive on them for a time, become fat and beautiful in the maternal eyes, and are duly admired by relatives. They are not, however, suited to an infant's digestive powers, and being largely composed of sugar and starch, they tend to ferment in the intestine, so that flatulent indigestion is a common result. As we are not yet able to adapt an infant's digestion to the ideas of artificial food manufacturers, the best plan for the present is to follow the guidance of Nature as far as possible. The safest and the simplest method of treatment in these cases of patent food indigestion is to discard the food altogether and to return to physiological feeding.

In the presence of chronic gastro-intestinal

catarrh which does not yield to simple dietetic treatment, or which is in an advanced stage, some modifications in the ordinary feeding are called for Further **dilution of the milk** may be tried. On part of milk may be mixed with two or three parts of lime water, and given in small quantities every two hours by day and every four hours by night In some cases it will be advisable to give nothing but lime water during the night so as to rest the alimentary tract more thoroughly. As toleration is established the strength of the milk mixture may be gradually increased. In other cases the **citrate of soda method** as suggested by Wright and practised by Poynton, seems to be of service. It consists in the addition of citrate of soda to the milk, one or two grains to each ounce of milk in the mixture as diluted for use. The curds formed in the stomach are believed to be rendered more digestible, and the vital properties of the milk are not injured in any way.

Special measures may be required to overcome the indigestibility of the proteids of cows' milk. For this purpose **whey** may be used. It is prepared by adding a drachm of liquid rennet to half a pint of warm milk. After the mixture has been thoroughly stirred it is allowed to stand until firmly coagulated. The curd is then broken up thoroughly, and the whey is strained off through muslin or a strainer. When whey is kept any time, or is to be mixed with other food, it is advisable to heat it to

160° F. in order to destroy the rennet ferment. One can begin with equal parts of whey and water, and give small quantities every two hours by day. Whey is usually well tolerated by the youngest infants, and one can gradually increase the strength of the food by giving it undiluted, then by the addition of some sugar or malt, and later of cream. The proteid element in the diet may be increased by adding ten to fifteen drops of raw meat juice or white of egg to each feed or alternate feed. Another method of meeting the difficulty which these patients have in digesting the milk albumins is by the use of **peptonized milk.** This may be done by a pancreatic extract, or by peptonizing powders, or by peptogenic milk powders. The details of the method of preparation are supplied with each packet. The last named is the most suitable for young infants, as the resulting product resembles closely breast milk in its chemical composition. As a rule the peptonizing process should not be prolonged beyond half an hour, and whole milk without any extra cream should be used. Infants take and digest peptonized milk well, but its nutritive properties are certainly inferior to those of fresh milk. As the digestion improves the peptonizing time should be gradually reduced from thirty to twenty and ten minutes.

One or other of the above methods will usually prove effective, but in exceptionally difficult cases one may employ **condensed or dried milk.**

A good brand of sweetened condensed milk, with all the original cream present, should be obtained. It must be given well diluted to begin with, one teaspoonful of the milk to four or six ounces of water, according to the age and state of the infant. The strength is to be gradually increased as toleration is established. Again one of the dried milks, such as plasmon, somatose, or sanatogen may prove useful. The dilution to begin with should be one teaspoonful of the powder to six ounces of water. Why it is that milk in these forms should apparently be better tolerated than fresh preparations is difficult to explain, but it is probably due to some change in the proteids which are rendered more digestible. In the case of infants under six months starchy foods are not to be recommended for digestive troubles. After that age they may sometimes be found useful, possibly from their mechanical action in reducing the size of the curds. The flour of barley or oatmeal or wheat may be used. A tablespoonful of one of these is to be boiled in a pint of water for an hour. Of this half to one ounce may be mixed with an ordinary feed of milk and water. At this age also one may sometimes aid the digestion of the milk by adding a small quantity of one of the converted starch preparations, such as Mellin's food, care being taken that not more than a half to one teaspoonful be given at a meal.

These are some of the more common dietetic

methods now employed for meeting the digestive difficulties of infancy. At the outset one must not only decide on the food, but proceed to give it a fair trial. The effect will not be seen all at once, and if the food is varied every few days there will probably be no improvement. A week or ten days at least are required to test the effect. At the same time it is often quite a good plan to combine two of the methods, giving for instance a diet of peptonized milk by day and of whey by night. Both of these preparations are for the same purpose, namely, to reduce the amount of proteid digestion in the stomach, and one may be able to tell from the symptoms which is most effective and to act accordingly. A little variety in the diet may also aid the stomach and bowels in recovering their tone. Perhaps more important than the food is the degree of dilution. The digestive powers are weakened and inactive and only the weakest foods will be tolerated. Hence the most excellent foods may prove useless simply because they are too strong. At the same time the stomach must not be flooded by large quantities of fluid food. Small amounts frequently repeated are better than larger quantities less often. It is best to begin with one to two ounces every hour, or two to three ounces every two hours. One may sometimes be at a loss to know whether the food is really agreeing with the infant. Favourable signs are a cessation of the whining and restlessness, the recurrence of smiling,

and longer and quieter periods of sleep. The subsidence of the active gastro-intestinal symptoms, flatulence, colic, etc., and an improvement in the quality of the stools are favourable indications. A gain in weight is not to be looked for at once as the diet in the early stage is one to rest the alimentary tract, not to fatten the child. It is not until all active signs have subsided and a more nourishing food has been adopted that the nutrition of the infant will improve. In the early stages also the amount of fat must be reduced to a minimum, owing to its indigestibility. In the convalescent stage, on the other hand, cream and cod liver oil are of the greatest benefit in building up the patient. The duration of the special feeding will depend on the severity and length of the illness. It must always be kept in mind that however useful as temporary measures, these methods of feeding should not be prolonged further than is necessary, because dangers lurk in the way. As soon as possible the infant should return to a diet of fresh cows' milk and other materials suitable to its age, as already described. The return to normal diet must be made gradually, by introducing one or two feeds of fresh milk in the course of the day.

The extreme form of malnutrition from gastro-intestinal catarrh is known as **marasmus**. Some infants are born with a very low vitality and with an alimentary tract which is apparently incapable of dealing with any form of food, but such cases

are rare. In the great majority of marasmic patients the underlying cause is improper food and feeding. The vital powers of the infant may be at the lowest before advice is sought, and a diagnosis of tabes mesenterica is often made. This condition, however, is of great rarity in infants. The methods of feeding as already described may fail. In such cases a wet nurse is the best line of treatment. If the infant is too weak to take the breast, the milk may be drawn off and given with a spoon. Failing to obtain a wet nurse one has to depend for a time on brandy and meat juice. A drachm each of brandy and fresh meat juice may be mixed with six ounces of water. Of this mixture one ounce may be given every hour for an infant of three months, eighteen feeds being given in the twenty-four hours. In place of the meat juice one may use weak chicken or veal soup. After a few days' trial of this some whey or peptonized milk may be given occasionally, and an attempt made to establish toleration of milk food. Another mixture which may be tried in these cases is composed of white of egg, two drachms, brandy and malt extract, of each one drachm, and water to six ounces. This may be given in the same quantities as the meat juice mixture. When, as often happens, the mucous membrane of the alimentary tract has become atrophied and functionless, the results of treatment are very disappointing.

In addition to the dietetic measures the infant

suffering from chronic gastro-intestinal catarrh must be kept warm and clean, and must have plenty of fresh air. The presence of diarrhoea or constipation will call for the treatment special to these disorders. Persistent vomiting, colic and flatulence are conditions which may require more than dietetic treatment.

1. When **vomiting** persists in spite of a carefully regulated diet there is probably always present in the stomach a residuum of food which is refused exit by the pylorus. Food remaining in the stomach is apt to decompose and not only to irritate the mucous membrane but also to set up spasm of the pylorus. This is best treated by washing out the stomach once or twice a day. The process in babies is a very simple one, and can usually be carried out without any disturbance of the patient. The apparatus required is a No. 10 or 12 soft rubber catheter, with a few feet of rubber tubing, the two being connected by a glass rod. A small glass funnel is fitted to the other end of the rubber tubing. The fluid to be used may be normal saline (one drachm of sodium chloride to a pint of boiled water) or soda solution (one drachm of bicarbonate of soda to the pint). The fluid used should be hot, so that it feels quite warm as it passes out of the catheter, a test which should always be made. The best time to carry out the lavage is two hours after a meal, so that one can determine

from the stomach contents how complete the digestion has been. The infant having been enveloped in a thick towel, so as to fix the arms, is laid on the nurse's lap or on the edge of the bed with the head slightly dependent. The catheter is then passed straight into the middle of the pharynx, when swallowing movements and gentle pushing will carry it into the stomach. The infant soon learns to swallow the catheter without much assistance. The length of catheter passed is from twelve to fifteen inches, measuring from the gums to the stomach, and it is not advisable to fill the stomach with coiled-up catheter, as severe retching will be induced. The danger of the catheter passing into the larnyx is slight, but after a few inches have been passed one waits to hear if the infant can cough or cry, and if the laryngeal tone is present, it is clear that the tube is not in the larnyx. Some ounces, four to eight according to the age of the infant, of the warm lotion are then passed into the funnel, which is elevated a couple of feet above the child's head. When the funnel is almost empty it is lowered over a basin on the floor, into which the fluid with any stomach contents will flow by syphonage. The process is to be repeated until the fluid flows back without any stomach contents, when one concludes that the stomach is thoroughly emptied. Vomiting induced by the passage of the catheter will do no harm provided the head is kept low to prevent the passage of the vomit into the

larnyx. If the catheter becomes blocked by large curds, it is plain that the diet needs correcting. In less severe cases of vomiting one may order a sedative powder such as the following :—

℞. Bismuthi carb., grs. v ; Pulv. ipecac. co., gr. ss ; Sodii sulphocarb., grs. iii.—T.D.S.

2. **Colic** and **Flatulence** are not necessary troubles during infancy, and should not be treated by dill water, frequent doses of castor oil, or soothing syrups. They are due to some fault of digestion, through improper feeding, and will usually pass off when a suitable diet is substituted. The sufferings of the patient, however, will often call for more speedy relief. This will be secured by (1) the application of hot fomentations to the abdomen, (2) an enema of soap and water, (3) a grain of calomel, and (4) a carminative mixture of the following nature :—

℞. Nepenthe, ℥ ¼ to ½ ; or Tr. Belladon., ℥ ii ; Ol. Ricini, ℥ x ; Sp. Chlorof., ℥ i ; Mucilag., q.s. ; Aquam menth. pip. ad ℥ i.—T.D.S.

2. After Infancy.—In the case of chronic gastro-intestinal indigestion in children beyond the age of infancy one must also recognize that probably the same factors are at work, namely, overfeeding and improper food. The course of events is often as follows : A child with a healthy appetite is allowed too full a diet, with an

excess of farinaceous foods and sugar. This excess of carbohydrate material is often given in such fluid form that the teeth are not used, the food is swallowed rapidly, and goes down so easily that much larger quantities are consumed than if thorough mastication had been necessary. By-and-by symptoms of intestinal indigestion appear. The child looks pale, and begins to lose flesh. A course of feeding up is begun, and beef juices, patent foods, cream, etc., are added to the already over full dietary. A friend probably suggests the addition of Parrish's food and cod liver oil. Finally there comes a complete breakdown of the entire digestive system. The course of treatment to be adopted is to give the overtaxed intestine as much rest as possible. Peptonized milk, or whey, and freshly made mutton, veal, or chicken soup are to be given in small quantities every few hours. A word of warning must be given to the cook that she is not to make the soup as "strong" as possible, but of the strength of ordinary dinner soup. When the intestinal rest has led to the recovery of appetite, solids may be begun in the form of fish, chicken, or mutton, plainly cooked with a little bread crumb or bread sauce. After toleration for these has been established, some carbohydrates may be added to the dietary, toast, milk pudding, and plain biscuit. Last of all the stage of fatty foods is reached—butter, yolk of eggs, cream, and cod liver oil, and the building up process will then go on

rapidly. The length of time taken to secure complete recovery will depend on the time during which the improper feeding has lasted. To prevent a recurrence of the condition one must arrange for the future a dietary which contains (1) a sufficient amount of hard food which requires chewing, and (2) a limited amount of farinaceous foods and sugar. For the former purpose beef or mutton or chicken should not be given to children in a minced or pounded form, but plainly cooked. Toast, rusks, biscuits, and raw apples entail an amount of chewing which is good for the digestion and the teeth. Further, the child's appetite will be satisfied more readily after chewing food thoroughly, and there will not be the same tendency to swallow down large quantities of food as in the case of fluid milk puddings. When a child has had a sufficient amount at a meal and still complains of hunger, a raw apple or a hard biscuit will be better than another helping of sweet pudding. The excessive use of carbohydrates is very marked in the present day. Many children are allowed to consume far too much bread and butter, and sweets. These must be strictly limited. Finally the coaxing of a child to eat more food must be absolutely forbidden. No child should ever be coaxed to eat, and much harm is often done by this line of treatment on the part of over anxious parents and nurses.

The state of the teeth, the gums, the tonsils, and the naso-pharynx should always be examined in cases

of chronic indigestion. Carious teeth and suppurating gums must be treated. A mouth swarming with pathogenic organisms, which are continually passing into the stomach in countless numbers, is a constant source of danger and may cause gastric catarrh. Similarly enlarged tonsils, with their crypts full of organisms, must be disinfected by local treatment, or, better, removed. A naso-pharynx secreting muco-pus must be put in a healthy condition.

Medicinal remedies will help materially in restoring the disordered functions of the intestine. At the outset a dose of castor oil (two drachms) may be given once or twice at bedtime. If there are signs of liver disorder, light-coloured stools, etc., calomel (two grains) may be given alternately with the oil. The following medicine may then be ordered.

℞. Tr. rhei, ℥ x ; Sodii sulphocarb., grs. v ;
Tr. zingib., ℥ v ; Aquam ad ℥ i.—T.D.S.

This may be given for a week or ten days, and then at intervals if necessary. Chronic constipation must be relieved by the use of small doses of cascara or senna pod infusion, thrice daily.

If the motions continue light coloured and the urine is loaded with urates a short course of mercury (grey powder grs. ii o.n.) and salines (phosphate of soda ℥ i or sulphate of soda ℥ i o.m.) may be given. The value of iron and arsenic as drugs in

such cases, even in the convalescent stage, is very doubtful. Personally I do not use them in this affection, preferring to give iron, if called for, in the form of food, and more especially of green vegetables.

Acidosis or Acid Intoxication.—The fact that vomiting is such a marked symptom has led me to consider this affection here. The pathology has not yet been definitely determined. A condition of acetonaemia seems to be associated with certain symptoms of acute poisoning in childhood, and to this the term acidosis or acid intoxication has been applied. The pathology of such cases is obscure, for it is not probably the acetone *per se* which causes the symptoms of poisoning, but some other substances, e.g., diacetic and oxybutyric acid, which are formed like acetone from the splitting up of fats in the body. There is probably some disorder of metabolism of unknown origin. Clinically the form of toxaemia under consideration is recognized from the smell of acetone in the breath, from the presence of acetone in the urine and in the vomit, and in severe cases from the presence of diacetic acid in the urine. The symptoms of poisoning may be mild or severe, and probably many mild attacks are recovered from, without the condition being recognized. In severe cases the leading symptoms are sudden and uncontrollable vomiting, persisting for some hours or days, and accompanied by con-

stant nausea, retching, and great prostration. The patient may remain in a collapsed state, complaining of constant thirst, or a condition of restlessness and delirium may follow, terminating in coma and death. An attack of acid intoxication may arise in childhood (1) without any known cause, as in "periodic vomiting," or (2) as the result of the administration of an anaesthetic, usually chloroform, or (3) from salicylic acid poisoning.

1. Under the various terms "**fitful vomiting,**" "**periodic vomiting,**" "**cyclic vomiting,**" and "**recurrent vomiting,**" a certain type of disease has been described of which vomiting is the chief symptom. The condition may arise in infancy or childhood. Whilst apparently in good health the patient is seized with vomiting which usually becomes severe and persistent. The attack may last for a few hours or a few days. The termination is usually as abrupt as the onset, and the restoration to health is rapid, the appetite and digestion being recovered almost at once. These attacks tend to recur at irregular intervals, and may be so severe and exhausting as to lead to extreme wasting and death.

2. Under the title "**delayed chloroform poisoning,**" Dr. Leonard Guthrie has described a very fatal series of phenomena which sometimes occur after the administration of chloroform. For some twelve or twenty-four hours after the anaesthetic the child may have been going on comfortably when

suddenly copious, frequent, and persistent vomiting comes on. The nausea, retching and vomiting are continuous, and after they have lasted for some time a dark "coffee ground" or "beef tea" fluid may be ejected. Constant restlessness, thirst, shouting, delirium, and air hunger are often present. Many of the cases terminate fatally. Post-mortem examination has revealed nothing save marked fatty degeneration in the liver, kidneys, and muscles. During life acetone and possibly diacetic acid are present in the urine.

3. The third class, in which we may regard a condition of acidosis as the underlying cause, is **salicylic acid poisoning.** Dr. Frederick Langmead has drawn the attention of the profession to the occurrence of a special form of "salicylate poisoning in children." The patients were under treatment for rheumatism, and salicylate of soda was being administered at the time of the onset of symptoms. In some cases the dose was quite moderate in amount, but in the majority very large doses were being given. The symptoms of poisoning were the same as those described in the two other types. Recovery usually followed quickly when the salicylate was stopped, and treatment by alkalies was adopted.

The proper **treatment** of an attack of acute acid intoxication is not yet finally settled, and we can only suggest here the lines which seem so far to have been most successful. In a sense, however, it

may be said that our knowledge of the treatment has advanced further than that of the pathology of this affection. The treatment is the same in all cases, but in the case of salicylate poisoning the drug should be at once stopped.

The first indication is to counteract the acidosis by large doses of an alkali, such as bicarbonate of soda. Twenty grains may be given in an ounce of cinnamon water every two hours until the urine becomes alkaline. Even with large doses of an alkali my own experience is that it is very difficult to render the urine alkaline. When the vomiting is so severe as to render administration by the mouth useless, the alkali may be given by the rectum, forty grains of bicarbonate of soda in two ounces of water every four hours. In urgent cases the alkali may be given like a saline injection into the subcutaneous tissues, in the strength of two and a half grains of soda to an ounce of sterilized water. Of this from a pint to a pint and a half may be injected daily. In this alkaline treatment other drugs such as citrate of potash or citrate of soda may be used if preferred. The elimination of the acids in the system is to be aided by free purgation and free diuresis. As a rule constipation is marked in such cases. A soap and water or castor oil enema should be given at once. The most efficient purgatives to give by the mouth are castor oil and sulphate of magnesia, but often the persistent vomiting renders their employment impossible. In

such a case calomel may be given, half a grain every hour until three grains are taken, or an evacuation takes place. In urgent cases elaterium may be used in doses of one-twentieth of grain. Elimination by the skin is to be aided by means of hot baths and hot packs. A hot pack will often be found to give great relief in such attacks, and is much less disturbing to the prostrated child than a bath. After the pack the skin acts freely, the child will often feel much relieved, and will sink into a restful sleep. The pack may be repeated every four hours with advantage. Sips of hot water should be given freely, even although everything is being vomited. The hot water does not increase the vomiting and it is one of the least irritating substances in the stomach, besides relieving the thirst. The question of diet hardly arises during an acute attack, but when food can be retained it is advisable to avoid all fatty material, and to give only digestible proteids and carbohydrates. Plasmon, Allenburys food, and peptogenized milk may be given at first, and then as toleration is established one may go on to oatmeal gruel, bread, farinaceous puddings, and sugar. If after twenty-four hours' illness the patient is still unable to retain any food by the mouth, nutriment enemata composed of peptonized milk (one ounce), glucose (half an ounce of a 10 per cent. solution), and brandy (half a drachm) may be given every four hours. Washing out the stomach with a warm alkaline lotion may sometimes

relieve the vomiting, but in other cases it proves useless.

The **preventive treatment** of many of these cases of acidosis presents great difficulty because of our ignorance of the exciting cause. This applies more especially to cases of periodic vomiting. With a history of previous attacks, one may reasonably advise the avoidance of any excess of fat or proteids in the diet, the maintenance of a regular and somewhat free action of the bowels, and a course of alkalies at intervals. An excess of proteids or fats in the diet seems to contribute to the tendency to metabolic disturbance. In the case of delayed chloroform poisoning, Mr. Beesley has found that a course of alkaline treatment for a week before operation has rendered the tendency to vomiting less marked. He gave fifteen grains of bicarbonate of soda thrice daily for eight days. The chie indication gained from the experience in Mr. Stiles's wards is that in septic cases, and in cases with acetonuria before operation, it is safer to give ether rather than chloroform. Although acetonuria may follow the administration of ether, the constitutional effects are usually absent or but slightly marked. In the case of salicylate poisoning, the first measure of precaution is to avoid large doses. Although in all cases of acid intoxication that unknown factor which we term idiosyncrasy probably plays a part, it is not necessary to begin with doses which may prove poisonous. If one commences with moderate

doses, watches carefully for acetone in the breath or urine, and stops the salicylate when this occurs; there will not probably be any marked symptoms of acid intoxication to treat.

CHAPTER IV

DISEASES OF THE ALIMENTARY SYSTEM

(continued)

DIARRHOEA—ACUTE PTOMAINE POISONING—CONSTIPATION — ABDOMINAL TUBERCULOSIS — WORMS — DISORDERS OF THE LIVER — CONGENITAL PYLORIC STENOSIS.

Diarrhoea is one of the commonest signs of intestinal disturbance in infancy and childhood. It may arise in connexion with a constitutional affection, e.g. rickets, which renders a child specially liable to catarrhal disorders, or in connexion with local disease, e.g. ulceration of the bowel, or from local irritation, as in the case of a bowel loaded with faecal matter, or from excessive peristalsis of nervous origin, as in the so-called lienteric diarrhoea. It is therefore necessary in every case to make a local and general examination so as to determine the exact causes, immediate and remote, which have led to the condition.

A large number of cases both in infancy and childhood will be found to be associated with im-

proper feeding. Diarrhoea may be one of the chief symptoms of chronic intestinal indigestion, which has already been considered. In infants overfeeding, too frequent feeding, and improper food will often cause diarrhoea, with or without the addition of gastric symptoms, vomiting, etc. The diarrhoea may be acute and occasional, or chronic and persistent. Pain of a colicky nature may be present in acute cases, and the motions may contain much mucus and even blood. The affection may be apyrexial in the milder cases, but, in the more severe the temperature may be raised for some time, due to active inflammation of the bowel or to the absorption of toxines. Acute attacks are prostrating to young children, rapid wasting takes place, and convalescence may be slow. In chronic cases wasting is also a marked feature, and a condition of chronic ill health is established.

The **preventive treatment** consists in the use of proper food for infants and children. Of special importance is the freshness of the food, milk, fruit, etc., for the most severe cases are those in which some decomposition has taken place in the food. This is the cause of the most fatal form of diarrhoea in early life, namely, the acute summer diarrhoea of infants. It is inadvisable in the case of breast-fed babies to wean during the hot season, as diarrhoea is very easily induced by a change of diet at this time. Whatever views one may hold as to the relative advantages of boiled and un-

boiled cows' milk it may be safely asserted that in hot weather all cows' milk for children's use should be boiled for two or three minutes and then kept on ice in a closed or covered vessel. The greatest cleanliness should be observed in connexi on with the feeding bottles, and no " dummy " soothers should be allowed in the infant's mouth. Any irregularity of the bowels, whether of the nature of constipation or diarrhoea, should be at once carefully treated. A mild attack of diarrhoea in summer predisposes to the more severe forms. The tendency to give young infants some fruit, which is so common with nurses in the fruit season, should be severely discouraged as being distinctly dangerous. The infant should be properly clothed so as not to be exposed to chilling of the body. The danger often lies not in too few but in too many clothes. If a child is at all delicate it is customary to overload it with clothes in summer, so as to avoid the risk of catching cold, with the result that the skin is constantly damp from sweating, and chilling of the surface of the body can scarcely be avoided. Such a chill lowers the resisting powers of the tissues generally, and of the alimentary canal more especially, so that an attack of diarrhoea often follows. The clothing should be light and loose, and a flannel binder ought always to be worn. These precautions are specially necessary in rickety infants.

The **treatment** of slight attacks of diarrhoea in

breast-fed babies consists in diminishing the frequency of the feeding times, or the amount given at each meal. Sometimes, although rarely, the maternal milk does not suit the child, and chronic diarrhoea results. If one cannot correct the breast milk by treating the mother, it may be necessary to put the child on some other food. In the case of bottle-fed babies diarrhoea is often due to an excessive amount of starchy material in the diet. One must therefore remove this source of trouble, which usually takes the form of some patent food, and put the child on to a proper dietary. A few doses of the *mistura ricini*, a few days of low feeding, and plenty of water to drink will cure these mild or chronic cases of diarrhoea in infants. The same applies to the case of older children where the dietetic element will be found at fault.

The most severe forms of diarrhoea in early life are the **Acute Summer Diarrhoea** of infants and **Acute Ptomaine Poisoning** in children. Both are associated with intense intestinal irritation and inflammation, and with systemic poisoning from the absorption of toxines from the bowel.

As the name implies, **acute summer diarrhœa** is an affection of the hot season, June, July, August and September. The higher the temperature and the longer the summer heat lasts, the greater is the incidence of this disease, which, in large cities at least, seems sometimes to come almost as an epidemic. It is essentially a disease of bottle-fed babies,

or of those who are receiving some food in addition to the breast milk. The origin of the disease is traceable to certain organisms in the food, chiefly in cows' milk, which multiply and cause intense irritation in the stomach and intestines. No one organism has yet been definitely associated with the disease and very likely more than one may produce the same effect. The exact method by which the milk is contaminated is unknown, but there is much evidence in support of the view that flies are the chief means by which the milk is infected. In many houses milk, whether fresh or tinned, is open to this source of contamination owing to its being left in an exposed condition, and wherever milk is there flies will gather.

During the summer printed papers containing the following instructions are given to all the mothers attending the Paddington Green Children's Hospital.

"In hot weather milk quickly turns sour or becomes tainted by dust, dirt, and flies, and may easily bring on diarrhoea unless the following **precautions** are taken :—

"Buy the milk *twice* a day—*not once* only—and get the best cows' milk you can, as cheap milk is always dangerous.

"Boil it at once for one or two minutes.

"Then place it in a covered vessel in a basin of cold water to keep it cool. The milk must be covered over to prevent dust and flies from reaching it.

"Always taste the milk, in a spoon, before putting it in the bottle, to see that it has not turned sour. Do *not* put the teat in your own mouth at all.

"Do *not* keep any milk left in the bottle for the infant's next meal. Use it for yourself or the rest of the family.

"The bottle should be boat-shaped with an india-rubber teat but *no* long rubber tube.

"The bottle should be scalded out after use, and cleaned with a bottle brush, which should be boiled immediately before using.

"After each feed the nipple should be turned inside out and washed, and kept with the bottle in cold water.

"Good milk is often spoiled by dirty bottles.

"When fresh cows' milk cannot be obtained, or the milk has turned sour, use the best sweetened condensed milk.

"Get small tins, as after the tin is opened the milk will soon go bad.

"Cover an opened tin with clean muslin or butter cloth to protect it from dust and flies, and keep in a cool place.

"In any case of sudden diarrhoea or vomiting stop the milk at once, give only plain water which has been boiled, or barley water, and take the baby to a doctor without delay.

"Do *not* think that the diarrhoea will pass off, as the baby may be so ill in twenty-four hours that no treatment will be of any use.

"Do *not* be afraid that the baby will starve if only plain water or barley water is given for a day or two. There is no danger of this.

"Do *not* think when a baby cries or is sick that it only wants more food.

"In hot weather do *not* keep bones, stale vegetables or fruit, and other rubbish for the dust-bin, in the room or house. Burn as much of the rubbish as possible. Rubbish breeds flies, and flies poison the food they settle on."

The disease runs a very acute course. An infant may be in a moribund condition at the end of twenty-four or forty-eight hours. In other cases, and more commonly, the disease will last for from four to seven days or longer. Not infrequently the acute diarrhoea passes into a chronic stage, as the result of injury to the gastro-intestinal walls during the acute stage. A previously healthy infant may be so altered by an attack of summer diarrhoea that it is many months before the intestinal functions are properly performed and the appearance of health is restored.

The onset of the disease is usually sudden, although, in some cases, there may have been slight gastro-intestinal disturbance for a few days beforehand. The infant becomes peevish, refuses its food, and is sick. The temperature rises, and the motions become loose, each evacuation being accompanied by the pain of colic. The condition rapidly becomes worse within a few hours. Vomit-

ing becomes persistent after each feed. The bowels are moved more and more frequently. The motions at first loose, but with yellow matter in them, become more watery. Some greyish or greenish material may be present, but the chief constituent is mucus or blood-stained mucus. If milk or other food is still being given it will pass rapidly through the alimentary canal unchanged. The stools may be extremely offensive. Great constitutional weakness supervenes. The pulse is feeble and rapid, the extremities are blue and cold, and the whole of the tissues seem to be shrivelling up. Anything offered is drunk greedily but is quickly vomited. In the most severe cases convulsions may occur, but a state of coma usually comes on, sometimes accompanied by hyperpyrexia, and sometimes by an abnormally low temperature.

While the inflammation of the gastro-intestinal tract is responsible for the acute symptoms of the earlier stages, the secondary symptoms are due to the absorption of the micro-organisms or of the toxins produced by them. Amongst the complications which occur may be mentioned catarrhal pneumonia, acute otitis media (usually suppurative), and acute nephritis. The acute septic condition sometimes merges into chronic septicaemia, with erythematous or pustular lesions of the skin, ulceration about the mouth, nose, and eyes, irregular pyrexia, and progressive cachexia.

As regards the **treatment** one must recognize

that this is an acute infective disease and that all precautions must be taken to prevent the spread of the affection. The patient should be isolated from other children. All diapers used should be sterilized after use by boiling, or better still should be destroyed. The nurse should carefully disinfect her hands after attending to the patient. Many different remedies have been recommended and tried and found wanting. Acids, alkalies, astringents, and antiseptics have all been regarded by various enthusiasts as of the nature of specifics, but the results obtained have disappointed those who have given them a fair trial. The disease is so acute in its course, and presents so many and such diverse symptoms, that no one line of treatment can be laid down. Instead of discussing all the different forms of treatment, it may be better to describe a method which will be suitable to most cases and probably as effective as any. It may be described generally as evacuant and eliminative. The first object is to remove the poison from the seat of its active production, namely the gastro-intestinal tract, and to eliminate from the blood and tissues the organisms and toxins which have found an entrance. At the same time one must prevent the introduction into the body of further doses of the poison, or of food materials which may prove a suitable medium for the growth of the organisms.

Milk in any form must be at once stopped. It

is especially dangerous in this disease, because it usually conveys the poison which is the starting point of an attack, and is a good medium for the further growth of the organisms in the alimentary tract. We have therefore to find some temporary substitute during the time that attention is being devoted to thoroughly clearing out the gastro-intestinal tract. In very acute cases the best plan is to stop all food entirely, and to give only boiled water or barley water or rice water for twenty-four or forty-eight hours. This usually meets with a strong protest in the domestic circle on the ground that the infant will be starved to death. The anxious mother may be assured that the infant is incapable of digesting or absorbing any food, and her attention may be directed to the motions, where the milk given has appeared quite unchanged. As the thirst is usually very great water should be administered frequently, every hour or two hours, but in small quantities, as vomiting is so easily induced. If the vomiting is very severe it may be necessary to give only one or two teaspoonfuls of water at intervals of fifteen or twenty minutes. A little brandy is probably beneficial if given well diluted—a teaspoonful in half a pint of water during the day, and the same amount during the night. At the end of thirty-six or forty-eight hours, or when sufficient time has been allowed for the thorough emptying of the bowels by medicine, a beginning should be made with food in the shape of

albumin water, or weak veal, mutton, or chicken soup. Here the rule must be to proceed very slowly and gradually, watching the effect. Albumin water may be made at first of the strength of half an ounce of the white of egg to half a pint of water or barley water, and this may be rendered more palatable by the addition of two drachms of extract of malt. Similarly an ounce of soup may be diluted with five ounces of water. As regards the feeding the rule should be to feed every two hours by day and not oftener than every four hours by night, and only to give small quantities at first—say one or two ounces. If the thirst is great, no harm is done by giving the infant water freely between the feeds. This modified diet may be carried on for one or two days, until the diarrhoea is somewhat lessened, and the motions are not of a purely mucous character. If the albumin water is found suitable there is no occasion to give the soup, but in some cases the soup seems better tolerated. The third stage is reached when we commence tentatively a return to milk food. A trial of milk in one or other form should be made by alternating it with the albumin water. Of the various forms in which milk may be used at this time the following represents a scale of digestibility: (1) peptogenized milk (without added cream), (2) whey, (3) condensed milk (diluted with twenty-four parts water), (4) equal parts of cows' milk, lime water, and barley water. Citrated milk (gr. i of citrate of soda to

each ounce of milk) may also be found suitable. It is not necessary to take every infant through these four stages, but in one patient one form of milk will be found to agree best, and in another patient some other form. If the milk provokes a recurrence of vomiting or diarrhoea, it must be at once stopped. Toleration will not be readily established and in no case must an attempt be made to feed up the patient rapidly. The chief points about the dietetic treatment are: (1) to give no food until the stomach can retain and digest it, (2) to begin with very weak foods, and very small meals, and (3) to let the patient have as much water as he can retain, so as to help in washing out the bowels.

The **medicinal** part of the **treatment** in the early stage consists in the thorough cleansing of the intestinal tract as quickly as possible. The best drug is castor oil, which is more effective if administered in small repeated doses. It will act by clearing out the irritating matter in the bowel without increasing the inflammation, or violent peristalsis. The *mistura ricini* will be found convenient for this purpose in doses of one drachm every four hours for the first thirty-six hours and then less frequently. It is usually well tolerated by infants, but if there is much gastric disturbance and vomiting it may be necessary to wash out the stomach first. Instead of castor oil one may use small doses of mercury, especially if the vomiting is severe.

Grey powder in one-third grain doses, or calomel in one-sixth grain doses, may be given every two hours until six doses have been taken. When the acute symptoms are subsiding, and the motions are becoming less frequent, a sedative mixture may be given as follows :—

℞. Sod. Sulphocarb., grs. ii ; Bism. Subnitr., grs. v ; Tragac., gr. ½ ; Glycerini, ℥ x ; Aquam Destill. ad ℥ i. Sig.—℥ i every six hours.

During the course of the illness various symptoms may be present which call for special treatment.

1. **Vomiting.**—When vomiting is severe the stomach should be washed out with a weak solution of Condy's fluid, or of bicarbonate of soda (grs. x to one pint). Until this has been done it is often impossible to adopt any effective treatment. The substitution of rectal feeding for stomach feeding is useless, as the bowel is not in a condition to retain or absorb anything. The sedative effect of washing out the stomach will be increased by the application of hot fomentations to the abdomen.

2. **Pain.**—When severe colicky pain is present, associated with tenesmus, four or five minims of paregoric may be given to secure relief. The use of opium in this affection is not without danger, and it should not be given if the patient is in a collapsed or semi-conscious condition. Opium should not be

given in a solid form, as in Dover's powder, as it will probably not be absorbed. If opium is contra-indicated, the tincture of belladonna, in doses of two or three minums every four hours, may be used for the relief of pain. Hot fomentations are also useful.

3. **Offensive Stools.**—The motions are sometimes so offensive as to render the air of the room most unpleasant. The addition of one or two grains of salol to the castor oil mixture will help materially in reducing the offensiveness of the motions. By its use also the stools will be rendered less acrid and irritating to the anus and buttocks.

4. The **restlessness** of the acute stage will be greatly relieved by the use of hot baths or hot packs. The effect of the bath may be increased by the addition of one or two drachms of mustard. The value of hot baths in this affection cannot be over estimated. In addition to calming the nervous system, and thereby inducing much needed sleep, they are stimulating, and by their action on the skin help to eliminate the poison from the system.

5. **Collapse.**—The great loss of fluid produced by the diarrhoea often leads to a condition of collapse, of shrivelling up of the tissues, and of cardiac weakness. This condition is best treated by the subcutaneous injection of normal saline fluid. A

Southey's or other small trocar may be used and the warm sterile fluid should be allowed to flow by gravitation into the loose tissues of the axilla or abdominal wall. From six to eight ounces may be injected at a time and the fluid should be allowed to enter slowly, so as to avoid the risks of sloughing or haemorrhage. The tissues will absorb the fluid rapidly, and when a part has been thus absorbed the restorative effect on the patient is often marvellous. The benefit thus obtained may be increased by small doses of brandy, nux vomica, or strychnine. These injections of saline fluid serve a further beneficial purpose, in aiding the elimination of the toxines from the blood and tissues, and should be repeated as often as necessary to keep up the fluidity of the blood and tissues. Strychnine is of undoubted advantage in collapse from cardiac weakness and is best administered hypodermically in doses of one-half minim of the liquor strychninae every four hours. The reaction of infants to strychnine in the toxic condition present is very much less than in healthy subjects, and full doses may be safely given. The value of brandy as a stimulant is undoubted if given in small doses, but it is very questionable if large doses are beneficial in this affection. For an infant of six months suffering from summer diarrhoea half an ounce of brandy daily is a maximum amount, and if one is not certain of its beneficial effect, it is better to limit the amount to one or two drachms a day.

During the acute stage it is advisable to preserve a cool and fresh atmosphere around the patient. To secure this end the infant should if possible be in the open air all day, and also all night if the weather is suitable. The presence of pyrexia is no contra-indication to this treatment, for the surface of the body can be protected as well out of doors as indoors. What the infant needs and should have is a constant supply of pure fresh air for the lungs. When convalescence has set in the utmost care should still be taken as regards the food and feeding, for relapses are very common, and are naturally more serious even than the initial attack, owing to the debilitated condition of the patient. The best restorative and the best protection against relapses, in the case of city children, is a change of air to the country or the seaside.

Acute Ptomaine Poisoning.—When a child previously in good health is suddenly attacked with vomiting, accompanied by marked prostration, even collapse, with diarrhoea possibly but without abdominal pain, one must think of the possibility of ptomaine poisoning. If there is a history of a meal—not necessarily very recent—containing tinned meat or fish or paste, or shell fish, or even (?) fresh fish one may have a clue to the nature of the illness, and this is much strengthened if other members of the family have been similarly affected. It will often be found that the senior members of

the family escape with a slight attack of vomiting or diarrhoea. The children, on the other hand, are often rapidly reduced to a state of complete prostration, with sunken eyes and shrunken face. The facial appearance will often suggest the disease at once to one who is familiar with it.

The Treatment.—One must at once take steps to eliminate the poison from the alimentary canal, and the system generally. The sooner this can be done after the poison has been taken the better is the prognosis. The stomach should be washed out with warm saline solution, even although vomiting may have been going on actively. Before removing the tube a dose of calomel (grs. ij or iij) along with sulphate of magnesia and sulphate of soda (of each one to two drachms) is to be introduced directly into the stomach. Afterwards it may be necessary to continue the dose of saline by the mouth until free purgation is established.

The patient must be kept warm in bed, with a plentiful supply of hot water bottles to combat the prostration. Feeding may be left out of account for four hours, but pieces of ice to suck, or sips of champagne, or hot water may be given to relieve the great thirst. Hot fomentations may be applied to the abdomen if pain is complained of in that region. One must not be tempted by pain or restlessness to give opium in this affection, as its effect inchecking the action of the excretory organs may

be fatal. Restlessness may be soothed by hot baths, and by rectal injections of chloral hydrate (grs. x) with potassium bromide (grs. xx). Stimulation may be urgently called for, and should take the form of subcutaneous injections of strychnine ($\frac{1}{100}$ to $\frac{1}{50}$ gr. every four hours) aided possibly by digitalin, adrenalin, and caffein. With the subsidence of the acute symptoms the immediate danger passes off, but the digestive organs may have been so seriously injured that they require careful dieting during a prolonged convalescence.

Lienteric Diarrhoea is a form of chronic intestinal irritability in which the food is apparently rushed through the bowel by abnormal peristaltic activity. The bowels act at frequent intervals, the motions are usually loose, and contain partially digested food. Frequently the taking of food induces an evacuation so that the patient cannot sit through a meal without seeking relief. Any extra exertion, or excitement, or a slight chilly feeling will lead to an evacuation. Some local nervous disturbance is apparently the cause of this condition, which is usually very amenable to treatment. The diet must be regulated so that nothing in the food or feeding should tend to maintain any gastro-intestinal irritation. At the same time it is not necessary to put the patient on a milk or "sloppy" diet. A plain wholesome dietary suitable to the age of the child should be ordered. Very definite thera-

peutic benefit is obtained from the use of arsenic, as in the following prescription :—

℞. Liq. Arsenic., ℥ iss ; Potass. Bicarb., grs. iii ; Inf. Gent. Co., ℥ xxv ; Aq. Chlorof., ʒ i ; Aq. ad ℨ ss.

Half an ounce of this may be given three times a day to a child of five years, and one ounce to a child of ten. The effect is usually seen in the form of marked improvement within a week and cessation of the trouble within a fortnight. In cases where arsenic fails, opium may be tried. Three minims of liquor opii sedativus may be given three times a day to a child of five years. Finally, if neither arsenic nor opium effects a cure one can try the combination of the two. After relief has been secured a tonic for the nervous system in the form of Easton's syrup (℥ x T.D.S.), may be ordered. Relapses are not common but may be met by a similar course of treatment as at first.

Diarrhoea from an **overloaded bowel** is not uncommon in children. The condition can be diagnosed from an abdominal examination, when hard faecal masses will be felt in some part of the large intestine or in the rectum. The treatment is thorough evacuation of the bowel by means of castor oil by the mouth (ʒ i to ʒ ij at night) and enemata of soap and water. (See Constipation.)

Constipation is a common trouble in infants, both breast-fed and bottle-fed. Without being immediately injurious to the child's health it is the source of much discomfort, and may induce a permanent weakening of the bowel and of the digestive functions. The most common cause of constipation is some fault in the quality or quantity of the food, and as a first step in the treatment the dietetic habits must be carefully inquired into and regulated. In the case of breast-fed babies this will also include an investigation into the mother's habits and dietary. Very often in the case of young infants the drinking of some plain water or barley water between feeds may serve to relieve constipation. In the case of bottle-fed babies a little extra fat may be added to the diet in the shape of a teaspoonful of cream or olive oil thrice daily, which has a lubricant action on the bowel contents. In other cases some additional sugar in the shape of malt extract will prove effective. The juice of grapes or oranges, a tablespoonful diluted with water, and given in divided doses, wil often relieve constipation. After the age of six months some farinaceous food in the shape of oatmeal or barley gruel may have a beneficial stimulating effect on the bowel wall. In older children the prolongation of a soft, pappy diet after the teeth have been cut, and the use of too refined foods, are apt to be followed by constipation. Intestinal peristalsis is weakened when there is no

solid residue in the bowel to call it into action. The fluid, non-irritating contents of the small intestine fail to stimulate the colon, and accumulate there as soft masses, which tend in time to become inspissated. Hence it will be found useful in many cases of constipation to order foods which contain some irritating particles, such as porridge, figs, etc., or which contain a considerable amount of indigestible residue, such as salads, green vegetables, tomatoes, and raw apples. Care must be taken that these substances, vegetables and fruits, are not given in excess, as the digestion may be impaired in the attempt to relieve constipation. In the case of young infants, the regulation of the diet will usually be sufficient without the employment of aperient medicines. At the outset, if the bowels are not acting naturally—once a day or oftener—it is advisable to give every morning a small soap and water enema (2 to 3 ozs.) or a glycerine injection (½ to 1 drachm), or a glycerine suppository. This may be continued for a week or ten days. If the motions are hard, and the evacuations cause any pain or bleeding, 10 minims of castor oil may be given thrice daily, as in the *mistura ricini*. Even in the youngest children, an effort should be made to obtain an action of the bowels by natural means, at regular intervals, so that the habit may be established. In cases of atonic constipation, massage of the abdomen is often helpful. The abdominal contents may be kneaded gently between the

hands, and rubbing may be employed along the course of the colon, from the caecum to the sigmoid flexure. A careful abdominal and rectal examination should never be omitted, for it will often be found that there is an accumulation of faecal matter in the rectum and sigmoid flexure, and even possibly extending along the whole course of the colon. If the faecal masses are hard, one can give at night an injection of two or three ounces of olive oil, which should be retained, so as to soften the hardened matter. In the morning an enema of soap and water is to be given. This process must be repeated daily until the colon and rectum have been completely emptied. If the accumulated matter is not hard, the soap and water injections will suffice without the oil.

The employment of laxative medicines is often called for in children who have passed the age of infancy, and in whom constipation has become chronic. From irregular habits or from improper feeding an atonic condition of the bowel has supervened. The child's general health is often impaired, a condition of chronic intestinal toxaemia being present. The use of occasional doses of strong aperients such as calomel, salts, castor oil, etc., gives temporary relief, but does no permanent good. What is wanted is a laxative which will be of a non-irritating kind, and will produce a daily emptying of the bowel, without pain or diarrhoea. As regards the dose of such laxatives, it may be

noted that a child between five and ten years will require about the same amount as an adult. In individual cases the amount must be determined by experience, and the mother must be clearly told what the desired effect is. In the administration it will be found very much better to give small doses three times a day than one larger dose at night. Cascara sagrada is one of the laxatives which has proved valuable in such cases. It may be given as follows :—

℞. Extr. Cascar. Liq., ℥ x to xv; Extr. Glycyrrh. Liq., ℥ v; Glycerini, ℥ v; Aquam ad ℥ i.—T.D.S.

The action of the cascara may be aided by the addition of tincture of belladonna (℥ ij), and if there is definite atony of the bowel by adding tincture of nux vomica (℥ iss). The bitter taste of the cascara is objected to by some patients, and a more palatable and equally effective preparation is the "cascara evacuant" of Parke, Davis & Co. The dose of this is also from ten to fifteen minims thrice daily. Another drug which is very useful in these cases is senna. The official preparations are made from the leaves, but the pods are more suitable for children. An infusion of senna pods is practically tasteless, produces no nausea or griping, and in moderate doses acts as a gentle laxative. It does not seem to lose its effect, but rather tends to improve the tone of the bowel wall, so that after

a time it may be discontinued. The fresh preparations are the best, and the ones on the market have in my hands been failures, probably owing to some chemical change from keeping. The medicine may be prepared at home as follows: Take four senna pods, place them in a small jar, pour on three ounces of boiling water, and stand for twelve hours. The infusion is then poured off and given in divided doses, one ounce thrice daily. Or the infusion may be ordered from a chemist as follows: A fresh infusion of senna pods to be made of the resulting strength one in six, and an equal amount of chloroform water to be added; dose, half to one drachm thrice daily. This should not be kept for more than a week. Another preparation which is useful is the laxative fruit pastilles of Burroughs, Wellcome & Co., each of which contains five grains of extract of senna fruit. The dose is one thrice daily. Regulating the dose of one or other of these preparations according to the indications, one is able to maintain a healthy action of the bowels in cases of chronic constipation. Senna pods will also be found useful in cases of rest in bed from illness or other cause, where the change of life is apt to induce constipation and some regular laxative is called for.

Abdominal Tuberculosis.—There are three chief forms in which abdominal tuberculosis is manifested in early life First, there may be tuberculous

enteritis, an ulcerative form of inflammation affecting chiefly the lower part of the small intestine, the caecum, and the colon. Secondly, there may be tuberculous mesenteric glands, a condition which is known clinically as tabes mesenterica. Thirdly, there may be tuberculous peritonitis. It is possible that any one of these types may occur alone, but as an isolated condition tuberculous enteritis or tabes mesenterica is distinctly rare in childhood. The commonest form met with clinically is tuberculous peritonitis. At the same time, while tuberculous peritonitis overshadows the others by its frequency and by the prominence of its symptoms, it is to be viewed as a result of tuberculous infection of the bowel. In some cases it may be that infection comes from the thoracic glands along the lymphatic channels, or from other tuberculous deposits viâ the blood stream, but such are not examples of abdominal tuberculosis, pure and simple.

Abdominal tuberculosis as a primary disease is not often met with during the first two years of life. Tabes mesenterica is not a common disease of infancy. "Consumption of the bowels," which is such a popular diagnosis, is most frequently a misnomer for chronic intestinal indigestion and diarrhoea, the results of improper food or over-feeding. At the same time, from the age of six months one may meet with typical and severe cases of abdominal tuberculosis. The majority of the cases occur after the age of two years.

The symptoms of tuberculous enteritis may be very slight, or there may be severe and persistent diarrhoea, with the passage of blood and mucus, and with a considerable degree of irregular pyrexia. The symptoms of tabes mesenterica may be wasting only, and unless one can make out definitely a mass of enlarged glands about the mesentery, the diagnosis must remain uncertain. Tuberculous peritonitis, on the other hand, is usually a well marked affection, and as it is usually accompanied by the other two conditions, we shall in the following remarks discuss abdominal tuberculosis under the name of tuberculous peritonitis.

The **preventive treatment** of **tuberculous peritonitis** consists in the use of wholesome fresh food as the diet, and of the maintenance of a healthy condition in the alimentary canal. The dread of tubercle-laden cows' milk has affected the profession and the public for some years, and elaborate methods of sterilization were introduced to destroy not only every tubercle bacillus, but also every spore. This was probably effected, but at the same time the nutritive value of the milk was destroyed. For practical purposes it has been found that boiling the milk for one or two minutes will destroy the bacilli, which as a rule are not abundant in cows' milk, unless the cow's udder is the seat of active disease. As a matter of clinical experience, I have found that tuberculous peritonitis may occur later in children who have been fed entirely at the breast

for nine or ten months. While it is most important that children should have tubercle-free food as far as possible, there is no evidence to show that the subjects of tuberculous peritonitis have been swallowing more tubercle bacilli than their neighbours who have escaped. It may be assumed that in town life and in crowded areas every child consumes in the food a considerable number of tubercle bacilli, both living and dead. *The real risk lies in an unhealthy condition of the alimentary canal, which may allow of the penetration of the bacilli.* Consequently the troubles of infancy and childhood—flatulence, diarrhoea, chronic intestinal catarrh and other disturbances of the gastro-intestinal tract, in so far as they weaken the self-protecting and resisting power of the bowel, may predispose to abdominal tuberculosis. With a history of a stormy period from the above disturbances in early life, and also a family predisposition to tuberculosis, one has to regard the danger to the child of tuberculous peritonitis as a real one. So far as the preventive treatment of tuberculous peritonitis is concerned, we shall probably do more by the regulation of the diet, so as to avoid gastro-intestinal disturbance, than by the attempt to destroy tubercle bacilli in the milk. If the mucous membrane of the stomach and bowel is in a healthy condition, it will be able to protect itself from the invasion and penetration of any tubercle bacilli. A distinct history of injury to the abdomen is often present,

which strongly suggests that a local injury may have weakened the resisting power of the bowel.

The **treatment** of the disease will depend on the nature of the attack. In some cases the onset is sudden, with high temperature, prostration, abdominal swelling, and possibly abdominal pain and diarrhoea. This type of the disease may easily be mistaken for typhoid fever. In other cases the onset is slow and marked by few symptoms, namely, slight abdominal pain, progressive abdominal distension, lassitude, and wasting. In a third class the child may simply appear to be "out of sorts," and no abdominal affection is suspected until the signs are detected by the physician on examination. An acute attack may run a course of from two to six weeks, without any marked improvement or alteration in the general condition of the temperature chart. In every case there is probably a period of active local tuberculosis, although the symptoms may not be severe enough to bring the patient under medical care. It is very doubtful whether during this stage any treatment will check this active process, although it may be the means of preventing serious complications. At the same time the recognition of this active period, and the fact that it may run into weeks without doing the patient any permanent harm, may enable physicians to wait patiently and not adopt more severe measures of treatment which are of doubtful value.

In all acute cases and in all cases with pyrexia,

absolute rest in bed should be ordered. The patient should occupy a large room with windows constantly open, and there should be one room for the day and another for the night. If circumstances allow, the rest should be carried out in the open air as much as possible both by day and by night. In short, the more that the "open air" treatment can be employed, the better; and if this is not available at home it may be obtained at a sanatorium, or at the seaside. The body warmth of the patient must be maintained by clothing and blankets and hot bottles, but these must be regulated so as not to induce sweating from excess of warmth.

The natural tendency is to put such cases on a "sloppy" diet—milk, bread and milk, and pudding. Experience has shown that this is the worst possible form of treatment. The abdominal swelling which is present is largely due to the intestinal catarrh or ulceration, with consequent flatulent distension and atony of the bowel. These conditions are increased on a diet of farinaceous foods and milk, which ferment in the bowel. The first part of the treatment is to clear out the bowel thoroughly, and the next is to put the patient on a non-fermentable diet. A drachm of castor oil may be given twice daily until four doses have been taken, or some other simple evacuant may be used. The diet selected should be one which will allay intestinal catarrh, which will not decompose readily in the bowel, which will be easily digested and absorbed, and which will supply

the system with the important constituents calculated to combat the affection. These conditions are best fulfilled by a proteid diet. At the outset, if pyrexia and loss of appetite are present, one can order a diet of mutton, beef, veal, or chicken soup. Small quantities of these should be given at frequent intervals during the day. For children, these soups should never be made strong, as concentrated soups are apt to produce indigestion. They may, however, be made more nourishing by the addition of raw meat juice, one to two ounces daily in divided doses, or plasmon powder, or somatose. As soon as possible, that is to say, when the patient will take it, more solid food is to be ordered in the form of pounded fish, or chicken, or mutton, with some breadcrumb and white of egg to make it more savoury and appetizing. This is to be given quite irrespective of the condition of the temperature chart, provided the patient's appetite is good. In some cases one will find that during the morning apyrexial stage the patient is ready for this more solid food, while during the evening pyrexia he is feeling ill and is disinclined for anything but fluids. Advantage should be taken of the fluctuations of the temperature chart to feed accordingly. Often one will find that although pyrexia continues, the patient's tongue is clean and the appetite is rapidly improving. Advantage is taken of this to put him on to a meat diet, which he can chew thoroughly. It must be recognized that in children over three

years of age a diet of plainly cooked food is more digestible and more nourishing than any forms of invalid cookery. The following dietary therefore may be ordered as suitable both for the later stages of an acute case, and for those chronic cases in which the temperature has never risen above 100° F.

Breakfast.—Fresh fish ; tongue, freshly boiled or tinned ; white of egg, raw or lightly boiled ; two small pieces of crisp toast ; one teacup of weak cocoa, with one ounce of milk.

Dinner and Supper.—Fish, chicken, sweetbread, tripe ; hot or cold, boiled or roast, mutton and beef ; chops and steaks. These must be plainly cooked, and served without any fat and without any sauce or gravy. A small quantity of breakfast or dinner biscuits (one tablespoonful), or two plasmon biscuits. Half a glass of claret.

If the appetite is good, as it usually is, three meals a day are better than frequent small meals. If, on the other hand, the patient is not inclined for a good meal, then the same materials should be given more frequently in smaller quantity. The amount of carbohydrate material is to be strictly limited, but a small quantity is probably not injurious and is much appreciated. Only a small amount of fluid is to be allowed at meals, as a dry diet is more digestible, but water may be given freely between meals. Claret acts as a tonic, and as an astringent when diarrhoea is present.

The benefit derived from one or other form of

this proteid diet is usually striking. The patients take it with relish and without discomfort. The abdominal distension usually subsides markedly within a week or ten days. The motions become more healthy in character, and if diarrhoea has been present it usually passes off. If there is no improvement under this treatment, one is led to suspect that there may be some grave lesion present, such as extensive ulceration of the bowel, or a mass of caseous and suppurating glands, or a rupture of some intestinal ulcer, with leakage and abscess formation in the surrounding tissues. It is plain one cannot expect improvement from dietetic treatment under such conditions.

The above diet, while it is strengthening and tends to maintain the vital powers of the patient, is not fattening. As soon as possible, one goes on to add some fatty food in the form of cream or cod liver oil to increase the nutrition. This is a much more severe test of the digestive powers, and the fatty food must be commenced tentatively and in small quantities at first. I have frequently found digestive disturbances follow at once, so that one had to fall back on the proteid diet. One drachm of cream or the same amount of cod liver oil and malt may be ordered three times a day. Some children will take by preference a sardine with some of the accompanying oil, and this, or the yolk of an egg, may be substituted. The amount may be gradually increased, and some beef or mutton fat

may also be allowed as the convalescent stage is reached. At this period also one may allow a return to milk and farinaceous foods, care being taken that the quantity given is small at first.

I do not say that a proteid diet is a cure for tuberculous peritonitis, but I believe that it places the patient in a better position to resist and conquer the attack of the tubercle bacilli. Just as a catarrhal condition of the bronchial tubes predisposes to pulmonary tuberculosis, so a catarrhal condition of the intestine predisposes to tuberculous peritonitis. As fresh air tends to check pulmonary catarrh, and thus allows of pure air entering the pulmonary blood vessels, so a proteid diet tends to check intestinal catarrh and allows the pure products of digestion to enter the blood stream. These are all the advantages that are claimed for it, but if the disease is not too advanced, the result is usually satisfactory.

As regards the **medicinal treatment**, reference has already been made to the evacuation of the bowel at the commencement. If the motions are offensive and flatulence is persistent, a mixture containing creosote (℥ ss) and salol (grs. v) may be given three times a day. Burney Yeo claims good results in tuberculous peritonitis from iodoform, given in pill form, but my own experience has been that its action is solely that of an intestinal antiseptic. It must be remembered that no medicinal antiseptics will counterbalance the effects of a diet which tends to produce intestinal sepsis. If diarrhoea

is persistent and weakening, the following prescription may be ordered :—

℞ Bism. Subnitr., grs. x ; Tr. Opii., ℥ ii ;
Sod. Sulphocarb., grs. v ; Muc. Trag.,
q.s. ; Aq. Cinnam. ad ℥ ss.—T.D.S.

In the convalescent stage, tonics such as cod liver oil with hypophosphites, nux vomica, strychnine, and port wine are to be given, but drugs such as arsenic and iron, which tend to upset the digestion, are better avoided.

As regards the **local treatment**, a flannel binder ought to be worn both for warmth and support. Abdominal pain is not usually great, especially when the patient is kept at rest, and can usually be relieved by hot fomentations, with or without a drachm of tincture of belladonna. In ascitic cases, i.e. when there is free effusion of fluid, a mercurial ointment may be spread over the abdomen. Half an ounce of unguentum hydrargyri compositum, or two drachms of unguentum hydrargyri, may be rubbed into the skin of the abdomen every second or third day for ten days or a fortnight. This will often be followed by absorption of the fluid. Dr. A. Morison has found benefit in these ascitic cases from tapping, and then strapping the abdomen firmly with strips of plaster. In the adhesive forms and those with tumour formation, local treatment is of little use and is better avoided.

The **surgical treatment** of tuberculous peri-

tonitis is a vexed question. Some years ago, in a discussion on this subject, Mr. Watson Cheyne said that the attitude of the profession had changed curiously during the last thirty years. At first, physicians had held that tuberculous peritonitis was an incurable and fatal affection. Then they found that surgeons could cure it, and had called in surgical treatment largely. Now they held that the disease was curable by medical measures. This description is correct, and so I believe is the final conclusion of the physicians. Laparotomy has been tried in every form of tuberculous peritonitis, but now surgeons claim that they get the best results in the ascitic form, and many say that simple laparotomy is of no use in other forms. The ascitic type is usually one of the mildest, and physicians get their best results in that form also. If a case with ascites is very persistent, and the fluid does not disappear under medical treatment, then it may expedite matters to tap and drain the abdomen with a Southey's or other trocar, or, if preferred, to have laparotomy performed. But of recent years I have had no experience of surgical treatment in tuberculous peritonitis, as I have had no occasion to employ it. As regards the results of laparotomy in ordinary uncomplicated cases, I have seen no changes follow which cannot be seen under medical treatment, save perhaps the formation of a tuberculous sinus. In certain complications, on the other hand, such as intestinal obstruc-

tion from bands or adhesions, or in localized abscesses, surgical treatment is the only one which offers any prospect of relief, and should be called in early.

The **prognosis** in uncomplicated tuberculous peritonitis is good, and even when tuberculous pleurisy is present, as frequently happens, it is still favourable. On the other hand, the occurrence of continuous pyrexia, of persistent diarrhoea, of a rapid pulse, or of recurrent acute exacerbations suggests the presence of some grave complication which renders the prognosis less favourable. These complications may be of a local nature, such as extensive ulceration of the bowel, with or without perforation, extensive caseation of the mesenteric lymph nodes or tuberculous masses, or localized suppuration. In other cases the complications may be of a general nature, namely pulmonary tuberculosis or tuberculous meningitis or general miliary tuberculosis.

Worms.—The worms most commonly met with in children are the thread-worm (*oxyuris vermicularis*), and the round-worm (*ascaris lumbricoides*). The number of subjective symptoms referred to their presence is legion, but the diagnosis is usually made by the discovery of one or more worms in the stools. One may be led to suspect their presence from an excess of mucus in the stools, from anal irritation at night, and from general restlessness and

irritability by day without obvious cause. The infection is probably carried in some form of uncooked food, such as fruit or vegetables, or it may be that the ova are picked up on the fingers from handling some source of infection, and are then conveyed directly to the mouth. These worms are comparatively rarely met with in the children of well-to-do parents, whose food is supplied under cleanly conditions. Even if the ova do enter the bowel they are not likely to remain there unless the alimentary canal is in an unhealthy condition. The prevention of intestinal catarrh is an important part of the preventive treatment of worms in the bowel. Wherever there is a possibility of fruit and vegetables having been infected, they should not be given in a raw condition to children.

In a case of **thread worms** a powder containing three grains of calomel and one of jalapin may be ordered for a child of five years. When this is given in the evening, there is often some vomiting during the night, the result of the calomel, but this does not affect its activity. Several motions will probably be passed next day containing thread worms. An injection of salt (½ oz.) and warm water (1 pint) should be given next morning, administered slowly with a long tube, so as to clear out any worms remaining about the rectum. At night an ointment composed of hydrargyrum ammoniatum (gs. v) and vaseline (℥ j) should be smeared

around the anus, and a small quantity of it passed into the bowel with the little finger. The powder should be repeated at the end of three days, while the other treatment may be continued as long as any worms appear in the motions. The diet should be simple and spare, and a mixture may be ordered to limit the mucous catarrh, such as the following :—

℞. Potass. Citrat., grs. x ; Sodii Sulphat., grs. xv ; Tr. Rhei, ℥ x ; Tr. Zingib., ℥ iii ; Aq. ad ʒ ij.—T.D.S.

These measures will probably serve to relieve the patient of thread worms.

The diagnosis of **round worms** is usually made by the presentation to the physician of a bottle containing the worm. It does not by any means follow that more are present, but it is always advisable to determine the point. A powder containing three grains of calomel and half a grain of santonin is to be given at night. This will usually bring away any worms which remain, but if any doubt still lingers, a second powder may be given three nights later.

The Liver.—The liver may be the seat of many disturbances in early life, but the special diseases are few in number. As in adult life, the leading symptom is jaundice, which is usually accompanied by less general disturbance in young subjects. We shall only refer to those affections of the liver

in which treatment may be of benefit, even although the pathology is not always clear.

Jaundice.—This may occur in new-born infants, and may be of a simple character, passing off in a few days or a week, so that no treatment is called for. In other cases it is more persistent, and may be associated with congenital obliteration of the bile ducts. Here no treatment is of any avail. A third variety is associated with **syphilitic hepatitis.** The jaundice may be present very soon after birth, or may not appear for some weeks later. The liver will be enlarged, bile may be deficient in the stools, and will be in excess in the urine, as shown by the staining on the diaper. It is important that syphilitic jaundice should be diagnosed early, because the treatment will probably be much more successful if early begun. The importance of the presence of jaundice is that it directs attention to the liver, whereas in the absence of this symptom an early stage of syphilitic cirrhosis may be entirely overlooked, and the opportunity for successful treatment may be lost. The prognosis in early syphilitic cirrhosis when treatment is thorough is in many cases good, but if it is delayed until fibrous tissue is fully formed, the prognosis is very different. Confirmatory evidence of syphilitic jaundice may usually be obtained from the presence of other signs of syphilis in the infant or from the family history, or from both.

The treatment should be full doses of mercury, one grain of grey powder three times a day, which may be supplemented if necessary by mercurial inunction (vide Syphilis). Even under this treatment the jaundice may persist for weeks, but the infant will probably be improved in its general condition, and the treatment must be persevered with.

After infancy **Catarrhal Jaundice** is not infrequently met with. An attack is usually shorter and milder than in later life. Apart from the jaundice, loss of appetite and slight malaise may be the only symptoms complained of. The immediate occasion of an attack is often difficult to determine, but there has probably been some gastro-intestinal catarrh or a chill leading up to it. Recurrent attacks at intervals are not uncommon. The preventive treatment consists in a simple dietary and the avoidance of over-feeding and exposure to cold. The immediate treatment consists in rest in bed and low diet. Fifteen ounces of milk and ten ounces of weak mutton soup per diem may be ordered during the acute stage. The milk may be diluted with equal parts of lime water. Medicinally, the patient may have at first a mild aperient, preferably two drachms of castor oil, and this may be followed up by a grain of grey powder every night. A gastro-intestinal sedative mixture should also be ordered as follows :—

℞. Tr. Rhei, ℥ v ; Potass. Bicarb., grs. v ;
Sp. Chlorof., ℥ ij ; Aq. ad ʒ j.—T.D.S.

In ordinary cases there will be marked improvement within a week, and disappearance of the jaundice within a fortnight. With the first signs of an increase of bile in the stools the diet may be gradually increased by the addition of boiled bread and milk and simple pudding, but a return to full diet must not be adopted too hurriedly.

"Bilious Attacks."—One is frequently consulted about children who are subject to "bilious attacks," according to the home diagnosis. This is sometimes regarded as a special development on the part of the child, and sometimes it is traced to the fact that the father suffered similarly when he was a boy. The attack is described as follows :—The patient, after being rather seedy for a day or two, is seized with vomiting, his appetite is lost entirely, his face becomes pale and sallow, and a considerable degree of prostration ensues. After a day or two all the symptoms subside, and recovery is rapid. There are different causes for such attacks, such as chronic gastro-intestinal catarrh, or a loaded bowel, etc., which have been already described. But in other cases there is reason to believe that the liver is the organ chiefly affected, that it has temporarily gone on strike after a period of overwork, or from acute toxic disturbance.

The **prevention** of such attacks consists in seeing that the normal action of the liver is not interfered with by chronic over-feeding or bad feeding, and that indulgences outside the ordinary diet are permitted in strict moderation.

The **treatment** of an attack consists in the abstention from food until rest has restored the gastric and hepatic functions. As all appetite is usually lost, this abstinence is not objected to. Water or barley water may be given freely to drink, but not in large quantities at a time. The medicinal treatment should consist of small doses of calomel, half a grain three times a day, with ten grains of bicarbonate of soda. With the return of appetite, weak mutton soup may be given alternately with milk and lime water, and for the calomel powders may be substituted a gentian and soda mixture.

In all cases in which a diagnosis of "bilious attacks" has been made in the family circle, it is advisable to make a careful abdominal examination, which not infrequently reveals some entirely different cause for the vomiting than the supposed hepatic disturbances.

Congenital Pyloric Stenosis.—This is an affection of early infancy to which attention has only recently been directed. Cases are still being constantly overlooked, the proper treatment is not carried out, and the babies die. We shall refer first of all to the clinical symptoms, which are

as a rule clearly defined, and allow of an early diagnosis if the possibility of pyloric stenosis be kept in mind.

The history is usually as follows :—An infant, healthy at birth, seems to progress satisfactorily for two, three, or five weeks, and then vomiting comes on. It does not matter what the food is, breast or artificial feeding, the vomiting persists. Frequently it is suggested in such a case to try another food, and the baby is started on a career of different diets. A most misleading fact in this connexion is that a change of diet has often a temporary effect in checking the vomiting. It may be only for a day, or a week, but the cessation of vomiting suggests that the disturbance is due to the food, that the appropriate food has not yet been found, and so the hunt continues. The result is always the same—failure of the treatment and death of the child. The vomiting is really a regurgitation of the food, without any of the signs of nausea, gastric catarrh, or acute disease. At the beginning it is moderate in amount, not specially violent, and only occasional. As time goes on—and time is measured by days in this affection—the amount of vomited material becomes larger, representing two or three feeds, and the violence of the vomiting is much greater, so that the food is shot out through the mouth and nose for some distance. The vomiting consists of the food only, partly digested, and while sometimes only the last meal is rejected, at

other times it is evident that the vomit consists of several meals. The amount vomited may be considerably greater than a normal stomach could contain at this age, showing that dilatation has taken place. The frequency of the vomiting varies, sometimes occurring only once a day, and at other times more frequently. The act of vomiting does not distress the patient, in fact it often brings relief, and the child is at once ready for another feed. It is almost characteristic of these cases that the infants are always ready for a feed, being in a chronic state of hunger. The infant wastes rather rapidly at first, and then more slowly, but steadily. The bowels are usually so confined that enemata or suppositories have to be used daily, and the motions are extremely scanty. The diagnosis is to be finally settled by an examination of the abdomen. If one has the infant lying quietly, soon after a feed, with the abdomen exposed, one can see, especially on tapping the abdomen, a succession of peristaltic waves passing from the ribs on the left side across the abdomen above the umbilicus to be lost in the right hypochondriac or lumbar region. On palpation of these waves, which are usually about the size of a large walnut, one can feel that they are due to firm muscular contractions of the stomach wall. Some writers lay stress on palpation of the pylorus as an important diagnostic aid, but this can only be done in certain cases and is not really necessary. The underlying lesion in these cases is a hypertrophy,

probably congenital, of all the muscular layers of the pylorus.

All are agreed as to the clinical symptoms, but a good deal of difference of opinion exists as to the pathology. A hypertrophic condition of the muscular tissues of the pylorus is always found at operations or on post-mortem examination in typical cases, although occasionally in practice one meets with atypical cases in which probably spasm is present without hypertrophy. The latter are much more amenable to medical treatment. The hypertrophy is believed by some to be due to a congenital hyperplasia of the pyloric muscle (Cautley), and by others to be the result of persistent spasm. From the therapeutic point of view it is important to note that the pyloric spasm is the chief factor, as owing to the spasm the food is unable to pass the pylorus. A condition of hyperplasia or hypertrophy should not, and probably does not, of itself prevent the pylorus from relaxing, but it may tend to render spasm more easily induced, and more persistent than under normal conditions. There is clinical evidence in favour of the view that such spasm is caused by the irritation of food in the stomach. However carefully an infant may be fed, some gastric disturbance or indigestion must happen at times, and this may be the starting point of a pyloric spasm which tends to persist. Hence we find that although the lesion is probably congenital, the symptoms may not appear for two,

three, or even six weeks. The sequence of events would appear to be, first gastric irritation, secondly pyloric spasm, and thirdly hypertrophy and dilatation of the stomach from its efforts to drive the food through the pylorus. The vomiting is induced by the irritation of the stagnant gastric contents, and sometimes by the large quantity of food which accumulates in the stomach.

The question of the best method of treatment for such cases is still unsettled, and must remain so until further experience has been gained. At first it was thought that the only possible means of cure was by operation, and many distinguished physicians and surgeons still hold that opinion. On the other hand some physicians have been able by medical measures to secure relief from all the symptoms and eventual recovery. In the light of our present knowledge the course to be recommended is, first, treatment on medical lines, and if that fails, operative interference, care being taken that the infant is not too weak before the surgeon is called in.

The important medical measures are, first, suitable feeding, and secondly, washing out the stomach (lavage). The food requires to be such that it can be completely digested in the stomach, so as to leave no solid residue to induce pyloric spasm. The difficulty therefore lies in the casein and the fat of milk. No food is better than breast milk provided it is of normal quality and contains no

excess of fat. This should be determined by chemical examination, and if necessary the mother's diet can be altered so as to bring her milk to the proper standard. In any case the breast milk should not be discarded until a strong effort has been made to use it successfully. Fresh cows' milk, as commonly used in infancy, is not as a rule well tolerated in this affection, at least for some time, and one has usually to commence with some substitute in which the casein is more digestible and the amount of fat is kept small. Peptogenized milk or whey may be used. In such cases also life can be maintained by the use of certain foods which are of themselves incomplete, but which are capable of being digested in the stomach, such as Allenbury's food (No. I.), Mellin's food, or malted milk. Whatever the diet is, the food must be given well diluted at first, and gradually increased in strength as toleration is established. A method which will be found useful is to alternate weak whey or peptogenized milk with one of the foods mentioned above. Sugar in the form of malt extract may be given in excess of the normal requirements, as it is very digestible. A little orange or grape juice may be given in water. To ensure complete digestion in the stomach of the food taken the quantity given at a time must be small and the frequency of the meals must be increased. From two to three ounces is usually as much as should be given at a time, and less may be called for if vomiting per-

sists. The feeding will often require to be carried out every two hours during the day and night, and sometimes one will obtain better results by feeding every hour during the day. Both the quantity and the frequency of the feeds must be regulated according to the results of experience in individual cases. One must not expect that the fattening up process will go on rapidly. Every attempt to increase the fatty element in the diet is often followed by gastric disturbance and increased pyloric spasm. There is no affection of infancy in which more difficulties are met with in the course of dietetic treatment than in pyloric stenosis.

Regular washing out of the stomach is a most important adjunct to the dietetic treatment. The method has already been described in connexion with the subject of vomiting (p. 69). It is usually sufficient to wash out the stomach once a day, but in severe cases it may be done twice daily with benefit. The complete removal of all irritating food material by lavage allays irritation and improves the digestion. From the nature and amount of the stomach contents removed one can judge as to the digestibility of the food and act accordingly. Improvement is to be recognized from the cessation of the vomiting, from the increased comfort of the patient, from the occurrence of healthy evacuations without artificial aid, and from the disappearance of the marked gastric peristalsis. The treatment will probably have to be carried on for some months,

even in favourable cases, although one is able gradually to increase the strength of the food, and to diminish the frequency of the lavage. The use of small doses of opium has been recommended as a means of reducing the pyloric spasm. In my own experience neither opium nor bromide of potassium has been of any use. Thirst is often present, and the shrivelling up of the tissues shows the need for water. This cannot always be supplied in sufficient amount by the mouth, but can be given by means of saline injections either *per rectum*, or subcutaneously. From a half to one pint may be given daily, and will greatly improve the patient's comfort and nutrition.

From what has been said as to the medical treatment it will be plain that it cannot be carried out amongst the poorer classes, save in hospital practice. In such cases operative interference seems the only resort. As already stated, if the symptoms are not definitely relieved and the child's nutrition maintained by dieting and lavage, one must also consider the question of operation. The mortality after operative treatment is high and will probably continue so, for the operation is a severe one, especially considering the age of the infant, it calls for much surgical knowledge and experience, and it by no means puts an end to the feeding difficulties. Probably in the past many of the operations have been carried out when the infant was *in extremis*, and surgeons naturally ask that their

services should be called in before this stage is reached. The operations which have been employed are (1) pylorectomy, (2) gastro-jejunostomy, (3) pyloroplasty, and (4) pylorodiosis or Loretta's operation. The exact method of surgical procedure will rest with the surgeon, but at present gastro-jejunostomy and pyloroplasty appear to be the most popular. After operation the sudden entrance of food into the bowel, which has been lying inactive for weeks, may induce severe and fatal diarrhoea. A similar condition, although milder in character, occurs sometimes after the pyloric spasm is relieved by lavage. One cannot but feel that the responsibility of advising operation in this affection is great. At the same time if medical treatment cannot be carefully carried out for a prolonged time, or if medical treatment fails to check the downward progress of the infant, one is justified in recommending it.

CHAPTER V

DISEASES OF THE RESPIRATORY SYSTEM

RHINITIS—FOREIGN BODIES IN THE NOSE—EPISTAXIS — POST-NASAL GROWTHS — ENLARGED TONSILS—CONGENITAL LARYNGEAL STRIDOR—LARYNGITIS STRIDULOSA — BRONCHITIS — ASTHMA — LOBAR PNEUMONIA — CATARRHAL PNEUMONIA — CHRONIC FIBROID PHTHISIS—PLEURISY—EMPYEMA.

THE preservation of the respiratory passages in a sound condition during the early years of life is a matter of the greatest importance, for the proper development and health of a child. Local disease in those passages is common, and may produce a weak spot at which an acute infection gains entrance to the system. Disease is apt to lead to obstructed breathing, which means imperfect ventilation of the lungs, incomplete aeration of the blood, and stunted growth generally. While considering the diseases of the respiratory passages as involving separate local areas we must bear in mind that several of these areas are frequently involved by

direct extension at the same time. Thus a simple cold starting as rhinitis may soon extend to the pharynx, larynx, and bronchi.

Rhinitis.—(1) **Simple Rhinitis.**—During the first few weeks of life it is very common to find that an infant's nostrils have become blocked as the result of a simple catarrh. Nature has been very economical of space in the nostrils, has lined the passages with a delicate and sensitive membrane, and has provided the possessor with limited powers of keeping those passages clear. Consequently a very slight obstruction, e.g. some inspissated mucus, starts a catarrh which, if not attended to, quickly becomes chronic, and may seriously interfere with the infant's feeding, sleeping, and normal development. It has, unfortunately, come to be regarded by many mothers as the normal condition of affairs that an infant's nostrils should be blocked or discharging, and "the snuffles" in the majority of cases is not the result of syphilis, but of the neglect which has followed from this foolish belief. It will therefore secure much immediate comfort to the infant, and prevent to a great extent the risk of future trouble, if it is made part of the daily toilette to clear out the nostrils with some non-irritating lotion. This may be efficiently done by inserting a fine camel's hair brush dipped in a watery solution of common salt (2½ grs. to the ounce), or bicarbonate of soda, (5 grains to the ounce), the

solution having first been warmed. A thin brush can easily be passed along the floor of the nose to the post-nasal space, and if sneezing is provoked it will only ensure more thorough clearing of the nostrils. After the washing out a little dilute ointment (zinc or boracic) may be introduced into the anterior part of the nostrils in a similar manner, and the nasal toilette is then complete for the day. This process may be kept up with advantage during the first two years of life, and until the child has learned to blow its nose and thus clear the passages.

An attack of **acute rhinitis** may be apparently excited by a chill, but it is more likely that exposure and chilling of the surface of the body only predispose the system to the invasion of some specific organism. A "cold in the head" is a form of specific fever, for which the system may have been prepared by any lowering influence such as chill, over-feeding, stuffy rooms, &c.

In early life the important **preventive measures** are plenty of fresh air, warm clothing suited to the season of the year, and a proper diet. It will often be found that the subjects of these "colds"—for the attacks tend to be recurrent—have been regarded as delicate infants. Consequently they have been burdened with extra clothes by day, have been buried in blankets by night, and have been kept in overheated and stuffy rooms, with the result that exposure out of doors at once brings on a chill.

When one is called to a child suffering from a cold in the head or simple rhinitis, the **general treatment** adopted should be such as to ensure not only relief from the immediate attack, but also the prevention of future attacks. In cases with pyrexia the child should be kept in bed until all fever has subsided. The body clothing should be warm, loose, and light, so as not to burden the infant or child. The sleeping and day rooms should be cool, well ventilated, and free from draughts. The effect of an overheated and stuffy atmosphere is to increase the discomfort of breathing in all catarrhal affections of the respiratory passages. A temperature of 62° F. in the room is quite high enough in all cases, whether pyrexial or not. The cot should stand clear of the walls, without curtains or closed sides, so as to allow of the play of fresh air all around. The mattress should not be too soft, and the pillow should be a firm hair one into which the head cannot sink. The diet will call for careful supervision. The food ought to be simple and non-stimulating and administered at regular intervals. In the case of infants under nine months nothing but breast milk, or cows' milk and barley water, is required. For older children, milk, porridge, puddings, bread, fish, and mutton are the standard foods. Beef tea and meat essences are often given by anxious parents in the most reckless manner, and to an extent which frequently aggravates the complaint.

Head colds and attacks of acute gastric catarrh are frequently combined in young children, and both may be traced in many cases to overfeeding and errors of diet. A constitutional tendency to such naso-pharyngeal catarrhs must also be recognized in many families of the gouty or rheumatic diathesis. This tendency will be aggravated in the case of children who live in towns during the wet and thick atmosphere of winter, or who live on a damp soil elsewhere. A prolonged residence in a bright and bracing inland place will often be beneficial in such cases.

The **local treatment** must be attended to. The nostrils should be painted, or irrigated, or sprayed with a simple lotion such as the following :—

℞. Sod. Bicarb., Sod. Biborat., Sod. Chloridi, āā grs. xii ; Glycerini, ℥ xx ; Aq. ad ℥ j.
Sig.—One tablespoonful to be mixed with two tablespoonfuls of warm water.

This may be used two or three times a day according to the amount of discharge, the number of hardened crusts present, and the extent of the obstruction. A little hazeline cream, or weak boracic ointment, may be introduced into and around the nostrils at night. As the purpose of the treatment is sedative, it is important that the opposite result, namely, disturbance, be not induced by struggling on the part of the child. Violent spluttering and coughing may have the effect of driving the fluid

up the Eustachian tubes, with consequent middle ear disease, but gentleness and care ought to obviate this danger. If the child cannot be taught to allow irrigation to go on quietly, with the fluid passing up one nostril and down the other, under a low pressure of water, easy respiration being carried on all the time, it is better to use the spray or brush.

The irrigation or spraying may be repeated as often as is necessary to secure the patency of the nostril, after the acute stage has subsided. The child should also be taught at as early an age as possible to blow the nose, not with those violent blasts which some like to indulge in, but with sufficient force to drive out all accumulated secretions and to keep the passages clear.

Medicinal treatment. — During the acute stage a powder such as the following may be given at night for the relief of the stomach and liver :—

℞. Pulv. Rhei, grs. iii ; Hydr. c. Creta, grs. i ss ; Magnes. Carbon, grs. i ss.

and at a later stage a mixture may be ordered as follows :—

℞. Sodii Salicyl., grs. v ; Tr. Rhei, ℥ x ; Tr. Zingib, ℥ iii ; Aq. ad ℥ j.—T.D.S.

These instructions may seem somewhat elaborate for the treatment of " a cold in the head," as a naso-pharyngeal catarrh is termed in ordinary language. But it must be remembered that such a cold if not

attended to will quickly extend down the respiratory passages. Further, if a chronic rhinitis is established, and is kept up by the habits of life, the child tends to become a mouth breather, and the path is made easy for the development of adenoid hypertrophy in the naso-pharynx, of chronic tonsillitis, of pharyngitis, of tracheitis, and of bronchitis. It is but too often the case that medical advice is not sought until some or all of these developments have taken place, but it is none the less advisable to be ready to take measures to prevent these when an opportunity presents itself.

(2) **Syphilitic Rhinitis** is a special form which will be referred to later (*vide* Syphilis).

(3) **Membranous or Fibrinous Rhinitis.**—The symptoms in this affection are very like those of a severe nasal catarrh. Nasal discharge, purulent or sanguineous, epistaxis, and nasal obstruction are present without any other local or general disturbances. On examination of the nostrils one finds that the mucous lining, in whole or in part, is covered with a yellowish white exudate, which is not merely inspissated muco-pus but is membranous in character, and leaves a raw bleeding surface when detached. One or both of the nostrils may be affected with this membranous exudate, which has a tendency to re-form quickly after removal. The importance of this condition lies in

the fact that it is really a form of localized diphtheria, and that virulent Loeffler's bacilli swarm in the membrane and the discharge. The infection may spread either along the nostrils to the nasopharynx and larnyx, or it may be conveyed to other persons by contact. At the same time it must be stated that as a matter of clinical experience the disease usually remains confined to the nostrils, without signs of general infection, and without any great tendency to spread amongst children brought in contact with the patient. The affection tends to run a very chronic course, and may persist for several months. Whenever there is even a suspicion that a nasal discharge is diphtheritic in origin, it ought to be examined for the presence of Loeffler's bacillus. If this proves to be present, full doses of antitoxin should be given, and the case treated as one of diphtheria. The use of antitoxin will prove more effective than any amount of local treatment. At the same time local measures should be carried out carefully. To clear the nostril or nostrils it may be necessary to remove the membrane with forceps, after which a lotion of weak carbolic (1 in 100) or corrosive sublimate (1 in 4,000) may be used three or four times a day.

Foreign Bodies in the Nose.—The presence of a chronic discharge from *one* nostril should always lead to a careful local examination. Children are very apt to pass all sorts of curious things up the

nostrils, e.g. buttons, pieces of paper, peas, &c. The result is the development of a nasal discharge which usually becomes purulent, and may be very offensive, irritating, and haemorrhagic. The foreign body may not be visible until the surrounding exudation has been irrigated away. It is usually easily removed by means of a bent probe or a pair of fine forceps. In the case of a frightened or very young child, cocaine solution or chloroform may be necessary. After removal, irrigation for a few days with an alkaline lotion will complete the cure.

Epistaxis may occur as the result of the haemorrhagic tendency in many blood diseases, in heart disease, and in the acute specific fevers. It may be so profuse as to call for treatment by the local application of adrenalin solution (1–1000) or even by plugging. The more common form is that which occurs in healthy young subjects of from nine to fourteen years of age. Anxiety may have been aroused by repeated attacks of epistaxis and advice is sought. If a careful examination fails to reveal the presence of any disease, the best treatment is to do nothing locally. The occurrence of epistaxis at this period of life is so common that it may be regarded as physiological. Instructions should be given that the child is not to pick the nose or to use his handkerchief too powerfully, that the bowels are to be kept well opened, and that moderation in the amount of food is to be observed.

Post-nasal Growths: "Adenoids."—By far the most common and the most important form of obstruction in the naso-pharynx is hypertrophy of the adenoid tissue. Probably in no form of obstructed breathing are the effects so numerous and so widespread as from post-nasal growths. The immediate symptoms for which patients are brought are very numerous. The chief complaint may be deafness, or cough, or snoring, or broken sleep, or a chronic cold in the head, or recurrent attacks of bronchitis, or general listlessness and debility. As a rule when not complicated with ear trouble this form of obstruction does not cause any actual pain, nor does it manifest itself to the patient by difficulty in breathing, owing to the slow development of the condition. During the day an amount of air sufficient for comfort is admitted by the mouth, even although the naso-pharynx may be completely obstructed. But at night these little sufferers, unconsciously trying to breathe through the nose, and failing to get a sufficient amount of air into the lungs by this channel, are affected by partial asphyxia. The result is seen in the restless sleep, the talking at night, the night terrors, and in what they sometimes describe as "suffocating dreams," in which they experience a choking sensation about the throat. Such a history ought always to arouse suspicion as to the presence of adenoid growths.

The **preventive treatment** of adenoid hypertrophy in the naso-pharynx is directly associated

with the etiology, a subject on which various opinions have been expressed. I have already suggested that many influences are at work in maintaining a condition of chronic rhinitis in infants, which is frequently the precursor of adenoids in children. If the cleansing of the nose in early life were attended to, and the dietary, the exercise, and the surroundings in the matter of fresh cool air were in accordance with physiological requirements, I believe that in the vast majority of cases adenoids could be prevented. Dr. Harry Campbell has laid stress on the unnecessary prolongation of "pap-feeding" as a cause of this trouble, the normal development of the bones being checked by the non-use of the masticatory muscles. This possible factor should certainly be kept in mind, for nature has made the naso-pharyngeal chamber of an infant so small that every effort should be made to expand it. Undoubtedly the use of the muscles of mastication will tend to develop the bones of the upper and lower jaws, and of the base of the skull, and by so doing will enlarge the naso-pharynx and nostrils. Amongst associated and predisposing diseases must be mentioned rickets and rheumatism. Both of these lower the resistance of the tissues generally, and both are characterized by a tendency to inflammation of the adenoid tissues. Damp, cold weather, such as is common in this country, plays an important part in inducing attacks of rhinitis, and therefore the prevention of adenoids in some

cases may only be secured by residence during the winter in a warm, dry climate. The remarks made already on the preventive treatment of rhinitis apply also to adenoids.

The **treatment** of obstruction from adenoid hypertrophy may be non-operative or operative the former in early and moderate cases, the latter in more advanced or severe cases. Different views would probably be expressed by a physician and a throat specialist. The following remarks are from a physician's standpoint. In early cases the measures about to be described will often be found sufficient to bring about a cure, provided that they are carried out systematically, persistently, and intelligently. One must exclude those cases in which there has already followed from the obstruction definite chest deformity, or deafness, or ear discharge, in which cases immediate relief of the obstruction by operation is called for. In mild cases the diet should be full, digestible, and non-stimulating, but no stuffing with food and meat extracts should be allowed. The child should have as much fresh air as possible night and day, and plenty of out-of-door life. Breathing exercises should be employed so as to develop the nasal passages and the chest as fully as possible. Lying flat on his back, with his mouth shut, the child should inspire and expire deeply and slowly through the nose for a few minutes at a time. The ordinary exercises for developing the chest and the muscles of the back

are also to be employed. The application of a firm abdominal bandage for an hour at a time while the patient is taking exercise will bring into play the costal muscles and relieve the overaction of the diaphragm, which is common in such cases. The body clothing should be loose and light, and any constriction of the chest walls, or interference with their free movement, must be carefully avoided. If there is evidence of crusts or muco-pus in the naso-pharynx a simple alkaline lotion should be syringed gently through the nostrils twice daily. The use of the pockethandkerchief should be taught and practised regularly. Any accompanying constitutional disease such as rickets or rheumatism must be appropriately treated. These measures if persevered with for a couple of months will usually lead to the disappearance of all symptoms, but it is difficult in private cases to get them efficiently carried out, unless a trained nurse is available. If the symptoms are not relieved at the end of two months it is advisable to adopt operative measures.

The operation of the removal of adenoid growths is theoretically perfect, but as a matter of practical experience it must be admitted that a considerable proportion of the patients operated on are not cured. Whether the anterior nares had been affected with chronic thickening of the mucous membrane, or whether they had been imperfectly developed, or whether the removal of the adenoid growths had not been completely effected, it is often impossible

to say, but the advisability of giving a guarded prognosis as to a complete cure has been impressed on me. In the case of young children, from one to four years of age, a recurrence of the growths after operation, with obstructive symptoms, is very common, so that it is better not to operate at that age unless the symptoms call urgently for such treatment. After operation the employment of chest-expanding exercises, and also instruction in what has become the lost art of breathing through the nose, will much increase the benefit obtained.

While the removal of any source of obstructed respiration in a child's nose is of the first importance, one must not trace every infantile and juvenile ailment to a small excess of adenoid tissue in the naso-pharynx. Epilepsy, asthma, incontinence of urine, congenital laryngeal stridor, stammering, laryngismus, and a host of other evils have been ascribed to the presence of adenoid tissue which could be felt, *but which had produced no evidence of obstruction by day or by night.* Many unnecessary operations have been performed on the view that the adenoid tissue was the source of all the mischief. For a time the removal of adenoids took the place of the removal of the foreskin as a cure-all operation. This surgical epidemic is now subsiding, and the opinion is getting firmly established that where there is no blocking of the naso-pharynx, no interference with the opening of the Eustachian tube, and no real obstruction to respiration, the adenoid

tissue cannot be regarded as the source of remote disturbances. On the other hand in cases of epilepsy, incontinence, &c., if there is nasal obstruction, from adenoid overgrowth, this condition must be treated as it would be apart from these ailments, and in some cases marked benefit will follow, probably from the improvement in the general health thus secured.

Chronic Tonsillitis is often associated with adenoid hypertrophy of the naso-pharynx, and so far as it is productive of symptoms is to be considered as one of the conditions leading to obstructed breathing. There is a further danger in that the tonsils are more liable, when chronically inflamed, to become a focus for the entrance of infective disease, e.g. diphtheria, rheumatism, tuberculosis. In cases of slight enlargement, and more especially when the tonsillar tissue is soft, benefit may follow from painting with astringents. Equal parts of glycerine of tannic acid and liquor ferri perchloridi may be used twice daily after meals. If this fails to reduce the size, a solution of nitrate of silver (grs. xx to the ounce) may be tried, applied every few days, or the tonsils may be touched lightly with silver caustic. Along with these measures the general health must be built up by means of plain nourishing food, cod liver oil, and hypophosphites. As a rule local measures, except in very slight cases, are of little permanent benefit.

The more radical treatment by means of excision is usually called for. This can be safely and easily carried out by means of the tonsil guillotine. As excision does not imply removal of the whole tonsil, recurrence is not uncommon, and operation is again called for. The common association of adenoids and large tonsils has rendered the operation of removal of both at the same time very frequent, and the results quite justify the adoption of this treatment.

Congenital Laryngeal Stridor.—This is an affection peculiar to infants, its presence being manifested within a few hours or days of birth by a curious inspiratory stridor. The sound is often compared to that made by a hen or a chicken, or to the purring of a cat. Frequently it is of a nondescript character. Various theories have been put forward as to the exact cause of the stridor, and it is important, from the therapeutic point of view, to adopt one which does not lend itself to active treatment, lest harm should be done. The stridor is evidently of an obstructive character, and Dr. Lambert Lack has been able to demonstrate during life a peculiar infolding of the epiglottis, an exaggerated condition of the infantile shape of the epiglottis, which, along with a loose state of the aryepiglottic folds, allows of these parts being thrown into vibration during inspiration. In the great majority of cases the infant suffers no incon-

venience from the condition, and the only distress exhibited is by the anxious mother, who brings her infant for advice. There is usually a slight amount of subcostal retraction during inspiration, but no other evidence of obstruction outside the larynx. In the great majority of cases no active treatment is called for. The stridor will usually persist for from six to nine months, and then gradually pass off. It is rare to find any trace of it after two years of age. In certain exceptional cases a history of attacks of cyanosis will be given. These require to be supervised more carefully because an element of danger comes in, but it is one which diminishes with each month of life. If a persistent condition of cyanosis comes on, as happens very rarely, then it is advisable to perform tracheotomy, or to have the infant in surroundings where tracheotomy can be performed at once if necessary. In all cases the infant should be carefully protected from chills, and other causes of catarrh in the respiratory passages.

Laryngitis.—Inflammation of the larynx is not uncommon in early life, and may occur in connexion with a common cold, by extension from the nose or throat, or as part of an acute infective illness, such as measles, influenza, or pneumonia. It is especially necessary to remember that during the invasion stage of measles, before the rash has appeared, an acute laryngitis, with loss of voice,

cough and marked signs of obstruction, may be present, and tracheotomy may appear to be called for. With the appearance of the exanthem, these acute symptoms usually disappear rapidly. Laryngitis may also be associated with diphtheria, with syphilis, and more rarely with tuberculosis. The form which falls to be discussed here is laryngitis stridulosa, which may be considered as a type of acute laryngitis.

Laryngitis Stridulosa is a form of disease which is met with from three to five years of age. The preliminary symptoms may have been slight, but usually there are some indications of catarrh about the respiratory passages, slight cough, huskiness and pyrexia. The special condition which gives the disease its importance is the sudden onset, usually during the night when the child is asleep, of spasm of the larynx. Crowing breathing comes on, with dyspnoea, retraction of the chest, a croupy cough, and all the signs of acute respiratory distress. The attack may soon subside, but is apt to recur on the same or the following nights, with varying degrees of severity. The subjects of this affection are popularly described as suffering from "attacks of croup." Whether the preceding condition is one of rickets or not it is impossible to say, but the spasmodic element has a distinctly nervous basis, and the sufferers require to have their nervous system strengthened in every way.

During an **acute attack** the patient should be kept in bed, in a warm, well ventilated room. The food should be light, non-stimulating, and given in small quantities at a time. Chicken or veal tea, milk and barley water, and whey are a sufficient dietary. A steam kettle, with the vapour impregnated with carbolic acid, or creasote, or cresoline, may be allowed to play about the bed for fifteen minutes at a time. It is not advisable to shut the child up in a steam tent, or to keep the steam playing about the bed continuously, as the heavy, hot, damp atmosphere thus induced becomes most trying. The intermittent use of steam as above described gives great relief and does not depress. Fomentations may also be applied round the neck and the front of the chest, and after one or two hours' continuous application they should be intermitted. They may be reapplied at intervals, but if continuously employed they seem to lose their beneficial effect, and increase the discomfort of the patient. At the onset it is very important to give a smart purge of calomel and jalapin, two grains of each. The spasm is often induced by gastro-intestinal irritation, and the inflammation will be relieved by a thorough evacuation of the bowels. If the attack is very severe, and the obstructive symptoms alarming, a few whiffs of chloroform may be given to check the spasm.

In **less severe cases,** or after using chloroform,

one can give opium and bromide to maintain a sedative action, as in the following prescription :—

℞. Liq. Opii. Sedat., ℥ i–iss ; Ammon. Brom., grs. v ; Ol. Ricini, ℥ xx ; Muc. Trag., q.s. ; Extr. Glycyrrh. Liq., ℥ x ; Aq. ad ʒ ij.

This dose may be given every four hours to a child of five years. When the acute symptoms have subsided, as they usually do during the following day, the frequency can be reduced to every six hours. When a day has passed without trouble the medicine can be reserved for night use. As in these days some young children will not take medicine by the mouth unless they approve of the proceeding, an alternative plan is to give bromide and chloral by the bowel. Ten grains of ammonium bromide and five of chloral may be injected *per rectum*, and repeated every four hours if necessary. The child should also be encouraged to drink hot fluids freely, such as barley water, thin linseed tea, &c., which can be flavoured with barley sugar, or saxin, or malt extract.

In the **convalescent stage** the child should be kept in the one room for some days after all pyrexia and stridor have ceased, as the larynx continues in a sensitive and irritable condition for some time. Tonics such as quinine (gr. i) and liquor strychninae (℥ i) are useful, to be followed later, when the digestion is good, by compound syrup of the hypophosphites, or cod-

liver oil with hypophosphites. The dietary to be followed is one containing plenty of fat, with carbohydrates and proteids in sufficient quantity, but without any overtaxing of the digestive powers. Any weakness in the adjoining tissues, such as adenoid hypertrophy, enlarged tonsils, or chronic bronchitis, must be attended to. The great restorative, in addition to a proper diet, is plenty of fresh air out of doors and indoors, and this in many cases will be best secured by a stay in some hilly district.

Bronchitis: Preventive Treatment.—Bronchitis is very common in infancy and childhood. Possibly the climate of this country and also town air in winter are factors of considerable importance in this matter, but still a very great deal can be done in the way of prevention, even in British surroundings. If instead of merely treating an attack of bronchitis we always tried to find out the cause and remove that, it is probable that we should be able to prevent further attacks. During the first two years of life one will find, in London practice at least, that some 70 per cent. of cases of bronchitis are associated with and dependent on rickets. The treatment of this underlying condition is therefore of the first importance (*vide* Rickets). Again, we have already referred to the importance of obstruction in the upper respiratory passages, nose, naso-pharynx and pharynx as a

predisposing factor in bronchitis. It is therefore most necessary in all cases of bronchitis to examine for chronic rhinitis, adenoid growths, and enlarged tonsils, because until the mouth-breathing which accompanies these disorders has been cured, it is futile to hope to secure permanent relief from bronchitis. Another factor which calls for notice in this connexion is adiposity. While all rachitic subjects are specially liable to bronchitis, it is more commonly found in fat, flabby children. In all cases of excessive stoutness the same tendency will be present, and is probably due to the obstruction in the circulation produced by the fatty tissue. This leads to a state of chronic venous congestion in the lungs, which induces catarrh of the bronchial tubes. The home surroundings are also often of such a character as to directly predispose to bronchitis. In the homes of the poor the children frequently breathe a close, hot atmosphere, all ventilation being cut off, and the whole family breathing again and again the same air, contaminated by themselves, by offensive matter lying about the room, and by the cooking of the food. In the homes of the well-to-do the same result is produced by different conditions. Children are kept in overheated, stuffy day-rooms and bedrooms, are often overloaded with clothes so as to protect them from cold, with the result that their bodies are overheated. When they are taken out a chill soon follows. Another factor is overfeeding. The

blood is overcharged with food materials, the pulmonary circulation is overtaxed in trying to get rid of these, and venous congestion and bronchial catarrh follow. Much can be done in the way of preventing bronchitis if the home surroundings, and the presence of local or constitutional disease, are always inquired into and corrected when necessary.

The **treatment** of an **acute attack** will vary in some respects according to the season of the year. In the cold season artificial warmth and confinement to one room are necessary. In hot weather, on the other hand, it is not desirable that the child should be shut up in one room. In winter the air of the room should be kept fresh, and should not be overheated, a temperature of 62° F. being quite high enough. The breathing is impeded under any conditions, and the difficulty is increased if the air is impure, or stagnant, or overheated. With the same end in view, one should secure the largest room available for the invalid, and should have the bed placed away from the walls and without curtains, so that the air can play freely about it. The sick-room should not be filled with anxious friends, who simply use up the atmosphere. Babies suffering from bronchitis or any other pulmonary affection should not be carried about or bathed in the ordinary way, but should be kept in bed, so as to save their breathing power as much as possible. The rest secured to the body enables respiration to

be carried on more easily, and the usual washing can be done in bed.

The diet during the acute pyrexial stage should be fluid and small in quantity. Milk and barley water, whey, gruel, chicken or veal soup are sufficient. Warm drinks, such as hot barley water or linseed tea, may be given freely, as they are the best diuretics and expectorants, and are therefore very useful. The use of the steam kettle was formerly considered indispensable, but has now largely fallen into disuse, and deservedly so, as a routine proceeding. Its continuous use, as in former days, was most enervating and exhausting to the patient, and produced an atmosphere exactly the opposite of what was desirable. Nevertheless, it has its use under certain conditions. If the patient, as often happens in the early stages, is suffering from a dry, irritating cough, and if examination of the chest shows the presence of many dry sounds, then the induction of bronchial secretion by the inhalation of steam may give great relief. If, on the other hand, secretion is free or over-abundant, then the use of steam is contra-indicated. Under no conditions should the steaming be continuous, or the bed be enveloped in close curtains. The full benefit will be obtained by allowing the steamer to play over the bed from the far end for fifteen minutes at a time, to be repeated every hour or two as long as the conditions persist. Creasote or terebene may be added to the water if thought desirable. Poultic-

ing has also largely fallen into disuse as a routine measure. There are, however, special indications which call for the use of hot applications to the chest, which will preferably take the form of fomentations, as these are much more easily prepared and are much more likely to be applied hot. Fomentations will probably give relief in the condition for which inhalation has been recommended, namely, the dry stage in which secretion is deficient. In bronchitis there is frequently present a considerable amount of dyspnoea, with loud expiratory wheeze, which is probably due to spasm of the bronchial tubes, as indicated by its paroxysmal character. When these attacks of dyspnoea from spasm occur, the application of hot fomentations to the back and front of the chest will often give relief. A drachm of turpentine may be added to the fomentation, and this can be repeated later if necessary. If plain fomentations are used, they may be applied continuously for an hour, and then intermitted. Continuous fomenting or poulticing of the chest is never advisable, but if the practice is carried out intermittently according to the indications, much relief may follow. In many mild cases of bronchitis the attack will not call for any of the above mea sures, and the routine treatment is to apply some stimulating liniment to the chest twice a day, such as the following :—

℞. Linim. Terebin. Acet., ℥ iii ; Linim. Belladon., ℥ i ; Olei Dulcis, ℥ ij.

During winter a layer of cotton wool is to be applied to the back and front of the chest, under the flannel vest, but in summer a flannel vest is sufficient. Care must be taken that there is nothing tight about the chest or the abdomen which would interfere with the breathing. The body temperature must be maintained by hot bottles.

At the onset of the attack the bowels should be freely opened. Three grains of rhubarb powder and two grains each of grey powder and carbonate of magnesia may be given at night, and followed by a drachm of sulphate of soda or magnesia in the morning. This will help to improve the condition of the alimentary tract, which is often affected with catarrh, and to relieve the bronchial congestion. Half doses of the above may be repeated every second or third night. A simple febrifuge mixture such as the following may be ordered :—

℞. Liq. Ammon. Acet., ℥ xv ; Potass Citrat. grs. v ; Tr. Aurant., ℥ v ; Aq. Camphor. ad ℥ j.—T.D.S.

Cough Mixtures.—The above medicine will often prove sufficient throughout the illness. The treatment of bronchitis and of other pulmonary affections has in the past been largely one of expectorant or cough mixtures. Prescriptions are common in which one finds drugs to increase expectoration, or to diminish expectoration, or to do both at the same time. Regarding many of the

drugs recommended and employed, our knowledge is infinitesimal, and we have no certainty that they act as they are supposed to. In the case of children, the one thing certain is that most cough medicines tend to upset the digestion. It is better therefore to limit our therapeutical zeal to conditions in the lungs which we can determine, and to drugs which we know will affect those conditions. In the early stage, when secretion is defective, and a harsh irritating cough may be associated with the dry catarrh of the tubes, iodide of potash (grs. ii) and carbonate of ammonia (gr. ss–i) may be added to the above mixture, or given separately as long as necessary. When secretion is free, this is not required, and it is only when secretion is over-abundant that we may require to interfere in order to diminish it. This may be effected by the following :—

R. Tr. Belladon., ℥ iv ; Ac. Nitrohydroch. Dil., ℥ iij. ; Glycerini, ℥ x ; Inf. Gent. Co. ad ℥ j. Sig.—℥ i every four or six hours.

When the patient is troubled with a persistent cough, one should examine the naso-pharynx and throat for signs of irritation, which may be relieved by a nasal lotion or simple throat lozenge. In other cases, and especially if the night's rest is disturbed by coughing, five to ten drops of paregoric may be given occasionally for its relief. Again, if special sedatives seem called for, a convenient form

of administration to children is in the form of pastilles, which may contain one-fiftieth of a grain of morphia or codeia. It must be remembered that a certain amount of coughing and expectoration is a necessary accompaniment of bronchitis, and medicinal sedatives are only called for when these are excessive.

By attention to the warmth and rest of the patient, by hot applications to the chest and moist inhalations when necessary, and by dieting simply, one will usually carry the patient comfortably through the illness. The disease is seldom fatal save in the case of children of very weak physique or debilitated by previous illness. In rachitic patients there is often a serious complication in the softened parietes of the thorax, and the muscular atony which makes ordinary respiration laboured, and greatly interferes with the increased respiratory action called for in bronchitis. Alcoholic stimulants are not to be recommended in the treatment of bronchitis, as they tend to increase the congestion of the bronchi. In cases accompanied by cardiac weakness, it may be necessary to use alcohol as a stimulant of the circulation. The indications for the treatment of heart failure will be discussed in connexion with lobar pneumonia.

In the **convalescent stage** one must see that the patient has a sufficient amount of animal fat. The chief forms of fat are butter, cream, beef and mutton fat, yolk of eggs, and cod liver oil. We have

already referred to the tendency to bronchitis which fat babies have, but in this case the adipose tissue is usually the result of excessive feeding with carbohydrates. The combination of cod liver oil and hypophosphites, as in the Emulsio Hypophosphitum, gives better results than any other drugs in restoring a healthy condition of the bronchial tubes. If anaemia is present, raw meat juice, green vegetables, and iron in small doses, may be given. Children of a bronchitic tendency should not live in large towns during the winter months. They should be in the country, in an upland district, where the soil is dry. Sea air is not suitable for such cases. In more severe cases it may be necessary to winter abroad in the South of France or in Italy.

Asthma in childhood presents the same peculiar aspects that it does in adult life. It comes and goes in different localities and at different times in the most puzzling way. An important part of the treatment is to build up the patient's health, and to correct any dietetic errors or local disease which may be present.

The nervous constitution which underlies the affection should not be overtaxed by lessons or excitements, or mental strain of any kind. The diet should be of a simple non-stimulating variety, the fats and carbohydrates preponderating, and the proteids, especially the meat proteids, being kept in moderation. As an attack is frequently induced by

overloading of the stomach, the meals must be moderate in amount. It is often advisable in these cases to give small meals at frequent intervals, so as to prevent the gastric disturbance which brings on an attack. Indigestible substances such as pickles, cheese, strawberries, shell fish, &c., must be strictly forbidden. It is often noticed that a certain article of diet, harmless to other children, may induce an attack of asthma in susceptible subjects, and this food must be interdicted.

The tendency to bronchitis, which is so often present, must be properly treated. This includes attention to the upper respiratory passages—the nose and naso-pharynx. While the cure of asthma is not to be expected from the removal of adenoids any more than from circumcision, great improvement will often follow the restoration of nasal breathing. One often finds after this relief that the frequency of the attacks is lessened, while the patient begins to improve in his general health. This improvement in the general health is usually progressive, and the tendency is for the asthma to get less and less marked as time goes on. One can usually give a good prognosis in cases of asthma in childhood, provided that the patient is in reasonably good surroundings, and that the instructions given are intelligently carried out.

The **medicinal indications** are (1) to maintain the regular evacuation of the bowels, (2) to allay and

prevent the bronchial spasm, and (3) to lessen the tendency to bronchial catarrh.

The bowels may be regulated by a dose at bedtime of cascara or senna pods. An acute attack of asthma is best treated by iodide of potash (grs. v) and carbonate of ammonium (grs. ii), thrice daily. As the attacks of dyspnoea become less frequent the dose may be reduced one-half and continued for one or two weeks. Other drugs, such as lobelia, arsenic, belladonna, &c., have not proved of much service in my hands, but one cannot tell beforehand what drugs of this nature may or may not suit an individual case. In some cases of chronic asthma, benefit may follow from the use of full doses of chloral hydrate, thirty to forty grains daily. The patient should be kept in bed and the drug pushed until he is under the influence of it. Chloral probably acts by checking the disordered action or " bad habit " of certain nervous centres.

The use of fumes of stramonium or asthma cigarettes is not to be recommended, as there is nothing curative about their action, and they are distinctly injurious to the bronchi, inducing a persistent catarrh. The best tonic for the bronchi is the emulsion of cod liver oil with hypophosphites, and this should be continued for months in all cases of chronic asthma.

Lobar Pneumonia.—Lobar or croupous pneumonia is a common affection in infancy and child-

hood. It may occur as a primary disease, or may be associated with influenza and other systemic infections. The pure type is that associated with the presence of the pneumococcus only. Although it is still usually described as a pulmonary affection, from many points of view it is better to regard it as a systemic infection with, as a rule, definite pulmonary lesions. In some cases, however, and this seems to occur with special frequency in early life, the systemic affection may produce local lesions, not in the lungs, but in the pleura, or peritoneum, or joints, or subcutaneous tissues. The pulmonary signs of lobar pneumonia and of catarrhal pneumonia may sometimes be so intermixed that the distinction is difficult in the early stages. The course of the two diseases is, as a rule, so different, that one is usually able to make an exact diagnosis as time goes on. In the case of a child previously healthy who is suffering from uncomplicated lobar pneumonia, the prognosis is always good. A fatal issue can almost always be traced to impaired health or poor nutrition in the child, or to the presence of some complication.

Treatment.—In an ordinary case and in the majority of cases, if the patient is put under favourable conditions as regards rest in bed, fresh air, and suitable diet, the disease will run its course to a favourable termination without any necessity for

active interference. No treatment of pneumonia has yet been devised which will shorten or influence the natural course of the disease, and many forms of treatment have fallen into well-merited discredit. It is advisable therefore that any treatment adopted should at least not be harmful to the patient. Nevertheless it is necessary that every case should be carefully watched by the physician for two reasons: first, to relieve troublesome and weakening symptoms; and, secondly, to treat complications if they arise.

We shall suppose that, the diagnosis having been made, the patient is put in bed, clothed in a flannel nightdress, with or without some extra flannel or cotton wool round the chest; that any chilling of the extremities is guarded against by the use of hot bottles; that the bed is not placed in a corner or close to the fire or covered with a tent, but in an open part of the largest available room, where fresh air can play freely about it (without draught), so that the lungs may have a plentiful supply of cool fresh air; that a diet of milk and barley water, with some mutton or chicken soup has been ordered, and that a febrifuge mixture containing citrate of potash and acetate of ammonia has been prescribed. In many cases the above treatment, with the help of good nursing, and the treatment common to all acute specific fevers, will carry the patient safely through the illness.

Certain symptoms may call for treatment.

(1) **Pain about the Chest.**—If the pleuritic pain is manifestly causing the child suffering, a local application in the shape of a turpentine fomentation or linseed poultice may be applied over the painful area for half an hour, or until the skin is thoroughly reddened. This may be repeated some hours later if necessary. These local measures will usually serve to relieve the patient, except in that very painful variety associated with diaphragmatic pleurisy. In this condition the application of a few leeches (two or three) over the affected area, combined with strapping of the affected side, may secure relief and rest. But if they fail to do so then opium or morphia must be given. Opium is distinctly contra-indicated in pneumonia because of its toxic effect on the respiratory centre, and as that centre is always affected to a greater or less extent in pneumonia it is as well to refrain from giving it for any symptom save very severe pain. We have to consider whether the patient will not be more weakened by the pain and restlessness than by the opium, and decide accordingly.

(2) **Coughing** may at times disturb the patient. The amount of coughing probably depends on the extent of lung involved. If there is a whole lobe involved, there will probably be a good deal of coughing from the irritation of the exudation. If only a small focus is involved, the irritation will be slight and the coughing trifling. It may be either

of the short hacking pneumonic type, or bronchial, from the presence of catarrh. In both of these the interrupted use of hot local applications will be beneficial. The position of the patient in bed must also be attended to, as frequently the coughing only occurs in certain positions, and is relieved by a change. The use of steam inhalations may also check an irritable condition of the bronchi. For the relief of persistent coughing, with or without much secretion, belladonna in doses of ℥ v–x of the tincture, or ℥ ¼ to j. of the liquor atropinae, will be found advantageous. It is especially indicated in pneumonia because (1) of its checking secretion, (2) dulling the sensory branches of the vagus throughout the lungs, and (3) stimulating the respiratory centre. One can also safely and beneficially give five to ten minims of paregoric occasionally for a hacking cough.

(3) **Pyrexia.**—The ordinary temperature of pneumonia, averaging from 103° to 104·5° F., requires no treatment. In children the height of the temperature is not an indication of the gravity of the disease, and the rapid recovery after the crisis shows that the pyrexia is not *per se* a source of weakness or danger. Prolonged continuous pyrexia, say after the seventh day, is probably weakening, but should not be interfered with by drastic measures, as the pyrexia may directly bring the crisis nearer. The medical profession is quite unanimous

in deprecating the use of antipyretic drugs in pneumonia. In some cases the temperature rises to 105° F. or 106° F. without the patient showing any signs of distress. Here, again, no treatment is called for. But if great restlessness supervenes, with sleeplessness, symptoms which we trace to the presence of hyperpyrexia, then some interference is called for. In the case of infants, the employment of a hot bath, which is rapidly cooled to 85° F., will frequently be followed by a fall of temperature of from 1° to 2° F., and the restlessness will disappear. In older children, sponging in bed with hot or tepid water is the corresponding treatment, and if extreme nervous disturbance is present the temporary application of cold water cloths to the head. It will often be found also that the application of a hot fomentation to the chest, combined with drachm doses of liquor ammoniae acetatis, has a distinctly antipyretic effect. An ice bag to the chest has its advocates, but my own experience has led me to avoid extremely cold applications in childhood and infancy. When confronted with a rise of temperature amounting to hyperpyrexia, one must not assume at once that this is due to the pneumonia. Disturbances of an entirely different kind may be present in other parts of the system, and may be sufficient to raise the temperature by a few degrees. Such a disturbance will frequently be found in the gastro-intestinal tract, and consequently, in the absence

of other definite cause, it is advisable to order a couple of grains of calomel or grey powder in cases of hyperpyrexia, with restlessness. Another possible source of hyperpyrexia is acute otitis media, which should always be examined for.

(4) **Sleeplessness.**—Pursuing the plan of securing rest to the patient, it is necessary to take action if sleeplessness occurs. Probably there is nothing more exhausting to the child's whole system than want of sleep. Delirious sleep is very common in pneumonia, and is probably not injurious. On the other hand, sleeplessness is often accompanied by active delirium and marked prostration follows. I have already referred to the presence of middle-ear inflammation, and this condition should always be looked for, and if necessary treated, when delirium and sleeplessness are present. Cold water to the head or hot applications to the chest may produce relief of these symptoms, but constant fussing about the patient with local applications is apt to increase the condition. Probably the free use of bromide of ammonium, in ten-grain doses, or bromidia in ℥ xv doses, is at once the most effective and the least harmful treatment. Sulphonal or veronal may be used, but not opium. A dose of brandy, ʒ ij to ℥ ss., in hot water, will often act like a charm. As a matter of clinical experience I believe there has been far less delirium and sleeplessness in pneumonia since we gave up

the " active treatment " of the disease, and simply kept the patient quiet and comfortable in bed.

(5) **Symptoms preceding the Crisis.**—The symptoms of pneumonia are as a rule most pronounced and most threatening for the twenty-four or forty-eight hours preceding the crisis, and possibly for a short time after it. This is very strikingly shown in hospital practice, where so many pneumonia patients are admitted shortly before the crisis. The explanation would seem to be that the condition of the child in mild cases of lobar pneumonia does not appear to the lay mind to be very serious until this pre-critical stage has been reached. The breathing and coughing may then have been observed to get worse, the restlessness greater, or the lethargy and prostration more profound. Sometimes an increase in the nervous symptoms may have excited alarm, sometimes blueness of the face or a tendency to faint may have been noticed. These or other signs have led the parents to seek medical advice for the first time. The same conditions are often present in cases which have been carefully treated from the first, and therefore it is important to be on the watch for the symptoms of the pre-critical or second stage of pneumonia. The longer the crisis is delayed, the more severe will the symptoms of the pre-critical stage become. This is the stage at which the active treatment of pneumonia should commence, as contrasted with

our previous treatment for the relief of symptoms. Not that even at this stage do we actually treat the disease, but only certain results of it which are of vital importance.

Signs of **cardiac weakness** are to be carefully watched for, and we have to note whether the failure is primarily in the left or in the right ventricle. There are many elaborate methods described for determining these points, but clinically the simplest method is best. If dilatation of the left ventricle is taking place, as the result of cardiac failure, we shall find the apex beat extending outwards to the left, the first sound at the apex becoming weaker, the pulse tension falling and the rate increasing, and a tendency to faintness and pallor appearing. At the onset of these signs the use of brandy, strychnia, and ether is indicated, in doses increasing in amount until we get a definite improvement. If the condition is more serious or is rapidly advancing, the hypodermic injection of strychnia is as serviceable in children as in adults. The injection causes little discomfort to the patient, and the only remark I have to make about the dose is that enough is not usually given. For an infant one year old in the pre-critical stage of pneumonia, liquor strychninae in one-minim doses by the mouth and half-minim doses hypodermically, every four hours, will produce good results. The reaction of the system to strychnia is much less easily induced in the profound toxaemia of pneumonia

than under normal conditions. Consequently the drug should be pushed until we get the desired improvement, or until some symptoms of the physiological action, such as twitching, have been produced. If dilatation of the right ventricle is present, with cyanosis, dyspnoea, and over-action of the right side of the heart, then some depletion of blood is called for. A very useful test as to the presence of this condition is the gradual enlargement of the liver, and clinically the increase in size of the liver will be found to be a very exact guide as to the degree of embarrassment of the right side of the heart. This may be accompanied by signs of oedema in the affected lung or the sound lung. The application of three or four leeches over the hepatic region, followed by a hot fomentation to encourage further bleeding, will usually be found to produce marked relief. Two to four ounces of blood may be removed in this way. This treatment is further aided by a dose of calomel (two to three grains) followed by a saline, and by the use of alcohol and strychnine as cardiac tonics. Instead of the leeching we may employ dry cupping over the bases of the lungs posteriorly, especially when pulmonary engorgement is present. It is also when cyanosis and right-sided enlargement of the heart occur that the use of oxygen inhalations, or better of a hyperoxygenated atmosphere about the patient, may be of distinct service. In the treatment of pneumonia

generally I have not been able to convince myself of the benefit of oxygen inhalations, and the patient does not appear to be suffering from a defective supply of oxygen; but in cyanotic conditions oxygen certainly gives relief in some cases and presumably benefits the patient.

We shall sometimes find that there is an increasing amount of respiratory distress, with dyspnoea and rapid breathing, which does not appear to depend directly on the pulmonary or the cardiac condition. We have here probably to deal with a failure of the respiratory centre from toxaemia. In such cases atropine, as a direct respiratory stimulant, may be combined with the strychnia, in doses of $\frac{1}{100}$th grain hypodermically every four hours, for a child of five years.

Certain **complications** may arise during or after the acute stage of the disease. Some are local, and may be traced to a spread of the disease by direct continuity. Amongst these the chief are empyema, otitis media, and pericarditis. **Empyema** should always be suspected when the temperature continues irregular after the crisis and when the signs of fluid are present in the chest (*vide* Empyema). **Otitis media** is a complication which is very common in children, but which is often overlooked owing to the absence of localizing symptoms. Pain in the ear may be complained of, but is more frequently absent. On the other hand hyperpyrexia, delirium at night, restlessness, and

even the series of symptoms comprised in the term "cerebral pneumonia," may be directly due to acute inflammation of the middle ear. In the presence of one or more of these conditions it is advisable to examine the membranes, and if any bulging is present to have a free opening made by incision. Irrigation of the ear by means of warm boracic lotion should then be practised. In the case of young infants the examination of the ear is somewhat difficult, and incision of the membrane is even more so. Those who are not sufficiently skilled in these matters may in the absence of expert assistance apply a leech behind each ear when otitis is suspected. If fluid is accumulating the membrane will probably soon rupture spontaneously. **Pericarditis** is a most serious complication and one that is easily overlooked. Like other inflammations of serous membranes in this affection it tends to be suppurative. Although we have classed this as a local complication it is quite as likely to complicate a pneumonia of the right upper lobe as one of the left lower. The infection may be spread by the blood stream. Unless the heart is being regularly examined, and the area of cardiac dulness is being daily watched, the condition will probably be overlooked as there is seldom any complaint of praecordial pain. If the condition is diagnosed and the presence of pus is shown by exploration, the only satisfactory treatment is to open and drain the pericardium

The **systemic infection** of pneumonia is shown by the occasional occurrence of arthritis, peritonitis, subcutaneous abscesses, meningitis, and nephritis. An **arthritis** may be manifested by inflammation and effusion in one or more joints. The effusion is usually purulent. If pus is found by the exploring needle, the proper treatment is to open the joint freely and drain it. **Peritonitis** is not a common complication and is manifested by the usual signs of that disease. Laparotomy and drainage are to be employed as pus is usually present. **Subcutaneous abscesses** may form after the acute stage is over, and may be single and large, or numerous and small. In one case I met with there were hundreds of small subcutaneous abscesses in an infant, which were pneumococcal in origin. Surgical treatment is also called for in these cases. **Gastro-enteritis** may develop acutely in the course of lobar pneumonia, so that one is forced to conclude there is a special infective inflammation of the alimentary canal. The symptoms of typhoid fever may be closely simulated, and as the pulmonary signs may be easily overlooked, an erroneous diagnosis may be made. The diet calls for special care and should be directed to the prevention of flatulence. An atonic condition of the bowel is apt to develop with meteorismus which seriously interferes with the action of the heart and lungs. In the presence of pneumonic consolidation the embarrassment of the lungs and heart thus induced

may be of grave import. Weak albumen water, whey, chicken and veal soup should be given in small quantities at frequent intervals. The following powder will allay irritation and check fermentation :—

℞. Pulv. Hydr. c. Creta, gr. ½ ; Pulv. Ipecac. Co., gr. ½ ; Salol, grs. ij ; Pulv. Cretae Arom., grs. v.—T.D.S.

Hot fomentations or a turpentine stupe may be applied to the abdomen at intervals. **Acute nephritis**, accompanied by haematuria, tube casts, and oedema may be present during the acute stage of pneumonia. As a rule it subsides rapidly after the crisis, and calls for no special treatment.

Catarrhal Pneumonia.—This affection is known under several different names such as lobular pneumonia, capillary bronchitis, &c., but perhaps the best term is catarrhal pneumonia, as there is catarrh affecting the bronchial tubes, and pneumonic involvement of the pulmonary tissue. It is a disease of very great frequency and importance in early life. The individuals most likely to be attacked are those whose general strength has been weakened by illness, or whose lungs have been injured by previous catarrh. The greatest incidence of the disease is during the first year of life, and at that age also the prognosis is most serious. The mortality is distinctly less during the second year, and diminishes steadily with every year of life until

after five years it is comparatively slight. While lobar pneumonia is to be looked on as a primary disease, catarrhal pneumonia is usually secondary. A large proportion of the cases accompany or follow on the specific fevers, e.g. measles, whooping cough, diphtheria, influenza, &c. Acute summer diarrhoea is responsible for another series of cases. The lungs of children suffering from rickets are specially liable to attacks of catarrhal pneumonia. If we exclude all the cases referable to the above causes, and to other preceding acute illnesses, very few will be left to be accounted for. A point of some importance is that a child suffering from catarrhal pneumonia secondary to one of the infective fevers must be regarded as infectious, both as regards the specific fever and the pneumonia. It is therefore advisable to have such patients isolated during the whole course of the illness, in a manner which is not considered necessary as regards lobar pneumonia.

We know a good deal about catarrhal pneumonia from the frequency of the disease and the many opportunities of studying the lesions in the *post mortem* room, but we know little about the treatment. If one considers the disease to be, as it probably is, an infective inflammation of the pulmonary tubes and tissues, of unknown origin, the difficulties in the way of a direct curative treatment are obvious. Cures are of course reported and are traced by the enthusiastic writer to some special means adopted, drugs, or baths, or poultices, &c.,

but no one of these has stood the test of experience. In catarrhal pneumonia, as in many other diseases, our treatment must be general and symptomatic, and we must be content to treat results until our knowledge of the cause is more complete.

A very great deal can be done in connexion with the **preventive treatment of catarrhal pneumonia**, if we bear in mind the great liability there is to this affection in all cases of infective fevers. For instance, the great mortality from measles in this country is due to catarrhal pneumonia, and it is not going too far to say that this mortality could easily be reduced one half if proper precautions were taken. Whenever a child has a fever the tendency has been to shut up the patient in a hot stuffy room, cover him with blankets until his skin is rendered unduly sensitive from over-heating and perspiration, and to let him out into cold draughty passages as soon as the temperature is normal. The result but too often is a chill which ends in catarrhal pneumonia, the poison still remaining in the system finding a suitable medium in the weakened pulmonary tissues. If, on the other hand, in all cases of infective fevers we insist on plenty of fresh air about the patient, and keep the body warm but not overheated, the risk of catarrhal pneumonia will be greatly diminished. A very interesting result has been obtained in this connexion by Dr. Claude Ker, who treated a series of cases of whooping cough by the open air method throughout the whole illness,

and found a marked diminution in the proportion of cases complicated with catarrhal pneumonia as compared with those treated in the wards of the hospital under the ordinary atmospheric conditions. Another point to be remembered is that the domestic belief that the patient is well as soon as the temperature is normal is not justified in connexion with the specific fevers, and that a considerable period must be allowed to elapse before the system is sufficiently free from the poison to allow of any precautions being omitted. Any pulmonary affection complicating an infective fever in childhood must be treated most carefully and thoroughly lest catarrhal pneumonia develop. During the winter and spring months in this country the period of enforced seclusion may be long, and may be the cause of much protest in the domestic circle, but a strong position must be taken up by the medical adviser, and he must insist on the careful observation of his preventive measures.

The **general treatment** of the disease proceeds on the same lines as in other feverish illnesses in children. Rest in bed, the use of sufficiently warm body and bed clothing, and the maintenance of a steady temperature (62° F.) in the room, are essential. At the same time an abundance of fresh air must be supplied, as in this affection the patient has need of all the fresh air he can get, and hot stuffy rooms form the worst possible environment. When one large bedroom is not available a couple of smaller

rooms can be used, one for day and the other for night use. The room which is not in use can be thoroughly ventilated, and a healthy atmosphere can thus be obtained for the patient at all times. No one but the nurse should be in regular attendance, as the presence of other people in the room does no good and may do much harm in using up the available oxygen. It is probable that in the future we shall come to treat all cases of catarrhal pneumonia in the open air, at least in the warm months. From my own experience of the "balcony treatment" in hospital cases I can state that no harm has ever resulted, and that several cases of catarrhal pneumonia seemed to benefit immensely. The chief difficulty in private practice is that the open-air method outrages all the domestic canons of treatment in this affection, the poultice and steam kettle still holding sway, and that skilled nursing is absolutely essential.

During the acute stage the food should be fluid, easily digested, and given in small quantities every two or three hours. Gastric and intestinal complications are common and must be carefully guarded against by dietetic measures. If appetite is lost it is much better to give very weak fluid food than to produce gastric trouble by feeding up. Albumen water, whey, peptonized milk, and veal soup may be given at first, and if the appetite is good, plain milk and barley water, bread and milk, Benger's or Mellin's food and milk, and thin milk puddings may be allowed. Diarrhoea is often

present and is not necessarily to be checked as it may be a means of relieving the blood of some of its toxic contents. If the diarrhoea is such as to weaken the patient then it should be treated by careful dieting, lime water, and small doses of castor oil. Water or barley water can be given freely, and the more one can act on the skin and kidneys by the use of plain fluids, the better is the prospect of clearing the poison out of the system. As regards the fever it is not often that a very high temperature, say above 104–5° F., is prolonged, and as the fever is usually of an irregular type, no active interference is called for in the way of antipyretic treatment. When a high temperature is associated with marked restlessness a hot bath or hot pack will often remove both conditions. Hot sponging and hot packs are soothing and stimulating, and are of very great value in this affection. They should be given with as little disturbance of the child as possible. In the case of those young patients it should be remembered that their energies are fully occupied in carrying on respiration, and that therefore their strength should not be taxed in other ways. Carrying babies about, prolonged bathing operations, and fussing about with poultices constantly will tend to exhaust the patient, who should be resting quietly in bed.

Coughing is often troublesome and in its treatment it is important to determine first the seat and nature of the irritation. If bronchial irritation,

without much secretion, is present, as often happens in the early stage, steam inhalations for ten or fifteen minutes, hot fomentations to the chest for an hour, and hot drinks are indicated. At this stage one may expect benefit from such drugs as citrate of potash, carbonate of ammonia, and solution of acetate of ammonia. If bronchial secretion is free, with loose bubbling dales all over the lungs, we follow another line of treatment. The emptying of the blocked tubes may be aided by partially inverting the child, by resting it with the head depressed, or by giving an emetic, such as one grain of sulphate of copper in a drachm of water. Emetics must not be used if the child is very weak or at a late period of the disease, as they are too exhausting. Excessive bronchial secretion may be checked by the use of tincture of belladonna in ten-drop doses, or of solution of atropine in one-drop doses. If, on the other hand, the nature of the cough and the signs in the lungs suggest that irritation of nerve filaments is the source of trouble, then paregoric in five to ten drop doses, or solution of morphia in one-drop doses may be given. In the case of catarrhal pneumonia we may rest assured that sooner or later the heart will suffer from the general toxaemia, and also the pulmonary obstruction. Digitalis should be given early so as to secure the effect of its action in time. Two to three minims of the tinctures of digitalis and nux vomica may be given three times a day,

and increased to five or ten minims if symptoms of cardiac failure appear. In the later stages the treatment of the heart condition becomes the most important. This subject has already been discussed in connexion with lobar pneumonia. When extensive consolidation of the lungs is present dry cupping of the back and axillae will often give relief. Leeching and venesection are also called for in this affection when the cardio-pulmonary embarrassment is great.

There is one form of treatment which is not to be recommended but which is sometimes carried out when a case of severe catarrhal pneumonia is suddenly sprung upon the young practitioner. He sees a child cyanosed, gasping for breath, with the lower ribs sinking in at every inspiration, and with all the indications for tracheotomy save one, namely stridor. Sometimes when one is hurried this negative sign is overlooked and tracheotomy is performed, without of course affording any relief as there is no obstruction to the entrance of air above the trachea.

The convalescent stage is usually prolonged, and rest in bed should be maintained until the lungs have thoroughly cleared up. Tonics such as cod liver oil and hypophosphites, iron, &c., will be called for, in addition to as nourishing a diet as the patient can digest.

Chronic Fibroid Phthisis. (Interstitial pneumonia, Fibroid induration of the lung.)—A condition of fibrosis in one lung, coming on as the result

of chronic bronchitis or pneumonia or pleurisy, and lasting for many years, is not infrequent in children. The physical signs are at first sight rather puzzling and from the dull flat note on the affected side (thickened pleura), and the shrinking of the costal wall, pleural effusion is often suspected. A careful examination will usually enable one to exclude the possibility of effusion, for the accompanying displacement of intra-thoracic organs is towards the affected side, and not away from it as in the case of pleural effusion. Sometimes however the exploring needle is used to settle the point and this may be attended by very serious consequences. It would appear from recently recorded cases that a very real risk of sudden death from haemorrhage attends the apparently trivial operation of exploring a fibroid lung. In doubtful cases, therefore, it is advisable to delay the use of the exploring needle, and repeated examination will enable one to make a diagnosis without it. The subjects of this affection are as a rule stunted, anaemic, languid, and delicate children. Their respiratory capacity is much diminished and the whole organism suffers.

The general **treatment** is to be directed to placing them in the best possible surroundings as regards home, fresh air, and good nourishing food, and to the avoidance of chills, over-exertion, and contaminated air of any kind. The clothing should be warm and light, the whole body being protected by flannel, and the feet more especially being kept

warm and dry. The diet should be a good nourishing one, in which the fatty element, as in cream, eggs, butter, &c., is well represented. By these means one endeavours to check the progress of the fibrosis by increasing the resisting powers of the patient, for any direct method of attacking the pulmonary lesion is not yet known. The best medicinal remedies are cod liver oil and hypophosphites, which should be given regularly throughout the colder months of the year. The symptoms of pulmonary trouble of which the patient complains are often slight. Coughing may be absent, or slight, or very troublesome. In cases associated with cavity formation (bronchiectasis), there may be much coughing and the expectoration of large quantities of pus at times. The use of dry inhalations may serve to check the secretion of pus, and to diminish the foetor which often accompanies it. A pad of cotton wool is to be sewn up in muslin or gauze. Five drops of terebene and creasote are dropped on one side of this pad, and the other side is applied over the patient's mouth and nose and fastened in position by tapes round the neck. This is to be used as a respirator three times a day for ten or fifteen minutes at a time. Terebene in five minim doses may also be administered internally three times a day. Garlic is a vegetable highly recommended for its beneficial action in such conditions. The emptying of the pulmonary cavities, which is often accompanied by prolonged and

harassing coughing, may be aided by inverting the patient or hanging the head well over the side of the bed so as to allow the action of gravity to come in. Pleuritic pains are not uncommon and may be relieved by a few small blisters, or iodine pigment. The chief complication is catarrhal pneumonia or bronchitis, and it is for recurring attacks of one or other of these that medical advice is frequently sought. Hence the importance of the hygienic precautions to which reference has been made. Whenever possible patients with active fibroid disease should winter in the south of England (Falmouth, Bournemouth), or in the south of France.

Pleurisy and Empyema.—Simple pleurisy, with or without effusion, is not a common affection in childhood. On the other hand empyema is frequently met with, most commonly as the result of pneumonia.

An attack of **acute pleurisy** is to be recognized by the same signs as in adult life and is to be similarly treated. Rest in bed during the acute stage, fluid diet, and a simple febrifuge mixture represent the general treatment. Locally counter irritation is to be applied by the painting of the affected side with equal parts of the tincture and liniment of iodine, and the chest is to be fixed by a firm, broad flannel binder. If the pain is severe, a couple of leeches applied to the painful area will usually give relief, or a turpentine fomentation may be applied in less

acute cases. The most severe type is diaphragmatic pleurisy, in which the pain of respiration may be agonizing, and the distress of the patient painful to witness. In such cases opium is called for and may be given freely until relief is obtained. For a child five years old five minims of liquor opii sedativus by the mouth, or two minims of the liquor morphinae hypodermically, may be given and repeated in two hours if necessary.

If **effusion** occurs there is no urgent call for tapping as the fluid usually subsides in the course of ten days under rest and iodine to the chest. The absorption of fluid may be aided by the administration of liquor hydrargyri perchloridi (℥ x to xv). and potassii iodidum (grs. ij to iij), thrice daily If the fluid persists beyond a fortnight without diminution, or if signs of fluid pressure appear, such as dyspnoea, fainting, failing pulse, &c., then the fluid should be removed at once.

Latent pleurisy may be met with, in which there have occurred no signs of acute illness, but the signs of pleural effusion are found on examination. Here also there is no urgency about the removal of the fluid until a trial has been given to rest and counter irritation. Tuberculous pleural effusion is very apt to be discovered in this accidental way.

The two steps in the treatment of pleural effusion which must next be considered are first the determining of the nature of the fluid by the exploring needle, and secondly its removal. The dangers of

needling the chest have already been referred to (*vide* Chronic Fibroid Phthisis). It is not advisable to use the exploring needle in all cases of dulness over the lung. Such a line of procedure shows a lack of diagnostic power, and of consideration for patients. A careful examination will usually enable one to determine whether the signs of fluid are sufficient to justify an exploratory puncture. If they are not, then there is no harm in waiting until they are. The spot to be selected for the puncture should be in the middle of the area of greatest dulness, whether that be in the back, or the axilla, or anteriorly. If the whole of one side is dull, the mid-axilla, above the fifth rib, or immediately below the angle of the scapula, will be found suitable for puncture. The patient can either be sitting up or lying down, preferably the latter, and should be so placed that the operator can conveniently pass the needle straight into the chest, at right angles to the plane of the surface selected. If not so placed one will find that the needle has a knack of wandering about amongst the soft tissues of the chest wall or impinging against a rib. The patient's arm should be elevated above the head.

The skin around the part to be explored should be thoroughly cleansed and disinfected. The apparatus to be used consists of a carefully sterilized exploring needle and syringe. The needle should always have a very sharp point, and a bore large enough to admit the passage of pus. It should be

boiled for five minutes immediately before use. In the case of very timid children chloroform, or chloride of ethyl (locally), may be used, but only in exceptional cases, and never in the case of infants. With a sharp needle the amount of pain is trifling. Having sterilized his hands, the operator finds the upper border of a rib at the part selected, and passes the needle firmly through skin and subcutaneous tissues. In children the distance of the surface from the pleura is short, and one must not make a plunge into the deep tissues. The tendency often is to plunge the needle so deeply that it passes through the fluid into the lung. Having punctured the skin and subcutaneous tissues, one pushes on slowly and firmly until a sense of diminished resistance is felt. The needle is now probably in the pleural cavity, and one draws back the piston of the syringe. If no fluid is obtained one should handle the needle like a probe and push it gently onwards. By moving the point of the needle about, one can usually feel whether it is in a cavity or not. If it is not free, then the depth of the puncture may be gradually increased, so long as the lung has not been entered. If the lung is punctured, there will be an up and down respiratory movement communicated to the needle, provided that the lung is not bound down by adhesions. If this movement is detected the needle should be at once withdrawn. If fluid has been obtained, it is advisable to fill the syringe so as to make a complete examination of the contents

later. Even if no fluid appears in the syringe, on withdrawing the needle, the syringe should be emptied of air over a glass slide. This will drive out any matter which may be blocking the needle, such as pus or coagulated lymph, and which may suffice to show the nature of the pleural contents. If nothing is found, it is advisable to puncture the chest again an inch or two from the place previously selected and in a similar manner. It occurs to all to fail at times to find fluid on one or more punctures. One may have struck coagulated lymph, or thick pus, or an adhesion, or gone too deeply, or not deeply enough. Repeated puncture will usually enable one to discover fluid when present. After the needle has been withdrawn, the puncture wound should be closed with a pledget of sterilized cotton wool or gauze and collodion. If fluid has been obtained, the treatment will vary according as the fluid is simple or purulent.

(1) **Simple Pleural Effusion.**—It must be noted that the fluid is not necessarily clear, for there may be a cloudiness about it from an excess of cells. This however is quite different from the yellow cloudiness of pus, and is different also in that it can be absorbed by the pleura, a result which is not likely to happen in the case of pus. If non-purulent fluid is obtained we have to determine, on the lines mentioned above, whether time should be allowed for natural absorption, or whether complete re-

moval is at once called for. Very often the removal of even a syringeful of fluid seems to act as the starting point of absorption, and the process will go on without further interference to complete resolution. If on the other hand immediate removal is desirable, we have the choice of syphonage or aspiration. Syphonage has the advantage over the use of the aspirator in that it allows of a more steady and gradual suction, and requires no complicated apparatus. All that is required is a sharp trocar with three or four feet of rubber tubing. These are to be sterilized before use. The rubber tubing is fitted on to the end of the trocar, the whole is filled with boiled water, and the free end of the tubing is then clipped and placed in a basin on the floor at the side of the bed. The trocar is then passed into the pleura, in the same way as in the exploratory puncture, and when the clip is removed, the head of water in the tubing will start a continuous flow into the basin. This will continue until the greater part of the fluid in the pleura has been removed. During the process the patient should be lying down, and if there has been any cardiac weakness beforehand, it is as well to give two or three drachms of brandy before the operation. The slow action of the syphon allows of a slow expansion of the lung, a point of some importance. Rapid withdrawal of the fluid and rapid expansion of the collapsed lung tend to induce coughing, faintness, pleural haemorrhage, and sometimes oedema

of the lung. If coughing comes on during the withdrawal of the fluid it is advisable to clip the tubing for a time, and if the coughing is severe and persistent, the trocar should be withdrawn, and a dose of liquor morphinae (℥ ii to v) given to the patient.

The aspirator in experienced hands is quite a safe instrument, but it requires careful regulation, and has no advantage over the syphon. One of the Dieulafoy type should be used, with an exhaust bottle attached. The receiving bottle should *not* be exhausted of air so as to produce a vacuum, as this leads to a rapid rush of fluid when the tap is opened, to rapid emptying of the pleura, and often to a flow of blood with the fluid. At the outset there should only be a partial exhaustion of the receiving bottle, and this should be repeated at intervals, so as to regulate the flow in a manner comparable to that secured by syphonage.

(2) **Purulent Fluid Effusion.**—The only satisfactory method of treatment in empyema is one which is thorough, and is suited to all cases. Tested by these standards, aspiration or syphonage is not to be recommended. While aspiration may be successful in rare cases one can never tell beforehand what the result will be, and in the majority of cases the fluid will reaccumulate, necessitating a more radical operation. Thick masses of pus may be present. even in recent cases, and they cannot

be done during full anaesthesia. As the danger from the anaesthetic is very real in an operation for empyema, the rule should be to give as little as possible, and to discontinue it as soon as possible.

The after treatment of simple and purulent pleural effusions consists in restoring the functional activity of the lung on the affected side as rapidly as possible. The patient should be allowed to walk about and indulge in such chest-expanding exercises as he is capable of. Massage to the affected side of the chest and passive chest-expanding exercises may also be employed. A full nourishing diet should be given, and the patient should be sent for a holiday to some bracing climate.

CHAPTER VI

DISEASES OF THE CARDIO-VASCULAR SYSTEM

CONGENITAL HEART DISEASE—CHRONIC HEART DISEASE—PURPURA: HENOCH'S PURPURA—ANAEMIA—SPLENIC ANAEMIA.

Congenital Heart Disease.—This may occur as the sole manifestation of disease, or it may be accompanied by other congenital defects, as in cases of the Mongolian type of imbecility. There is no form of treatment which will directly tend to remove the cardiac lesion. In some cases it is slight and is apparently due to delayed development. These may ultimately lose all symptoms, and the signs of a cardiac lesion may disappear. As a rule the condition is a permanent one, and the patients are from birth more or less crippled. The body development generally tends to be poor, and the patient is prone to attacks of intercurrent disease.

The **treatment** to be adopted is a protective one. The child should be carefully guarded against chills, and the body clothing should be warm, especially about the extremities. Cold hands and cold feet

must be avoided by the use of warm gloves, warm stockings, and hot bottles if necessary. The diet should be nourishing and plain, and any disturbance of the digestive organs should be carefully guarded against. Pulmonary troubles, e.g. bronchitis, are common and are apt to increase the signs of cardiac embarrassment. They must always be very carefully treated. If the breathing is obstructed by adenoid growths or large tonsils they must be removed under an anaesthetic, and incidentally it may be remarked that the subjects of congenital cardiac disease seem to suffer no inconvenience from the administration of chloroform. Tepid or warm baths are to be used in preference to cold. As attacks of dyspnoea and increased blueness are apt to come on under any excitement or exertion a placid life should be cultivated as far as possible. School life, children's parties, and athletic games are not suitable. Sudden attacks of cardiac distress are to be treated with brandy and strychnia, while the onset of cardiac failure calls for the systematic use of digitalis. The prospects of life in an infant born with congenital cardiac disease are bad, as statistics show that hardly one-third of such cases survive to the age of two years.

Chronic Morbus Cordis.—The treatment of the acute forms of cardiac disease will be found in the chapter on rheumatism. Notwithstanding the great frequency of rheumatism and valvular disease in

childhood, it is only in a small proportion of the cases that one has to treat the child later for chronic cardiac disease. Many will have no further symptoms, and in others the results of the valvular lesion will not be such as to call for treatment until later in life. In cases of severe valvular disease, or myocarditis, or pericarditis, it is probable that cardiac symptoms will persist. In cases also of recurrent attacks of rheumatism in a patient already affected with heart disease there will probably be progressive cardiac disease calling for treatment. But in the majority of cases it will not be until after childhood has passed that the effects of a simple valvular lesion will bring the patient for medical advice. Consequently it cannot be too strongly impressed on the student that the discovery of an organic cardiac murmur in a child is not an indication for the administration of digitalis, strophanthus, and other cardiac tonics. Nothing but harm will follow from such a procedure. One must be on the outlook for signs of failure of compensation but must withhold treatment until they have appeared. Failure of compensation is indicated by certain signs and symptoms. Amongst the signs one may find weakening or rapidity of the pulse, dilatation of the left or right ventricle, weakening of the first sound, engorgement of the liver, pulmonary catarrh or congestion, cyanosis or pallor, oliguria, or oedema of the extremities. Amongst the symptoms there may be breathlessness, palpitation, faint-

ness, or headache. One or more of these will indicate that the time for treatment has arrived. The object to be aimed at is two-fold, (1) to make the work of the heart as easy as possible, and (2) to strengthen the cardiac muscle.

(1) Complete rest in bed is the chief means of **lightening the heart's work**, and it must be maintained for some time after the evidences of failure of compensation have been removed. The child should not be excited in any way by visitors, or stories, or the presence of other children. The state of the organs below the diaphragm must be attended to, as flatulent distension of the stomach and bowels, or constipation, or an engorged liver may seriously interfere with the cardiac action. Flatulence will be best avoided by a diet which is solid, and which contains fish, fowl, mutton, eggs, and toast as the chief ingredients. The meals should be small in amount, and given more frequently than under normal conditions, every three hours by day and not at all by night. If the appetite is not such as to make chewing a pleasure, the food may be pounded or very finely minced, but it must be eaten slowly. Fluids should be given between rather than with meals, and the amount should be limited to one pint daily. One must carefully avoid under such conditions a diet of soups, strong meat essences, and milk, all of which tend to induce flatulence. A fatal termination may be brought about in severe cases of cardiac disease by overloading the stomach

and thus producing dilatation, and upward pressure. Digestion being at a standstill or much diminished, the food remains in the stomach and ferments there. Later the gradual distension of the stomach by food and gas presses the diaphragm upwards, and induces fatal syncope by mechanically obstructing the cardiac action. The important point to remember is that the period of cardiac failure is not the time to strengthen the patient with much food, but that depletion is the first requirement. Enlargement of the liver, which is a valuable and common sign of cardiac failure is to be relieved by mercury and salines. Three grains of grey powder or one grain of calomel may be given at bedtime for a week, and followed each morning by two or three drachms of sulphate of soda. For congestion of the liver or lungs the value of leeching must not be forgotten. Two or three leeches may be applied over the part affected, and after they drop off further bleeding may be encouraged if necessary by the application of a hot fomentation. The bleeding from a leech bite, which used at times to be difficult to stop, can usually be checked quickly by applying adrenalin chloride solution (1–1000). If leeches are not at hand, dry cupping may be used, and in some severe cases it may be advisable to bleed directly from the arm, up to four or five ounces. Constipation must be relieved by cascara, senna pods, or liquorice. The restlessness of the patient is best combated by small doses of opium given in the form of

liquor opii sedativus (5 minim doses), or Dover's powder (1 grain), or liquor morphinae (2 minim doses).

(2) In addition to relieving the work of the heart one employs direct **cardiac stimulation.** The most prompt effect is produced by means of brandy or whisky and strychnine. The value of brandy as a general tonic may be a matter for discussion, but no one who has had experience of it in the treatment of heart failure in children can have any doubt as to the benefit derived. The amount to be given will vary with the urgency of the symptoms, but speaking generally one can use from one to three ounces daily, in divided doses, for a child of five years. It must be remembered that its action will be most beneficial if the remedy is not given continuously. After five or six days it is advisable to discontinue the brandy, and to hold it in reserve for future emergencies. One should note the fact that in the hot months of summer the effect of brandy is greater than in colder weather, and consequently a smaller dose is required. Strychnine is another prompt cardiac stimulant which should always be given hypodermically in emergencies or severe cases. One-minim doses hypodermically, or two-minim doses by the mouth, of the liquor strychninae may be given every four or six hours to a child of five years. Perhaps the best results are secured by giving brandy and strychnine alternately. Other cardiac tonics which act promptly are ammonia,

caffein or hot coffee, ether, and nitroglycerine (half-minim doses of the liquor trinitrini).

The great cardiac tonic for chronic weakness and dilatation of the left ventricle is digitalis, which takes a few days before manifesting its influence, and is therefore not of much use in emergencies. The rapidity of the action will be increased if one gives digitalis in massive doses, as recommended by Dr. A. Morison, who has obtained good results by giving treble doses for twenty-four or forty-eight hours. Perhaps the most reliable and effective preparation is the fresh fluid infusion, which may be given in doses of half to one drachm every four or six hours for a child of five years, or a reliable tincture of digitalis may be used in five-minim doses. When one is using digitalis a record should be kept of the pulse rate, the amount of urine, and the presence or absence of vomiting. When the pulse begins to be steadily lowered, or when the amount of urine is increasing, the dose of digitalis may be reduced one-half, as the effect of the drug is cumulative, and it should not be pushed too far. Vomiting arising during the administration of digitalis is also an indication for intermitting or diminishing the dose. It is very important, however, to push the drug until some evidence of its action has been obtained. If one employs two or three minims of the tincture thrice daily it may be weeks before any effect is produced, and the drug may be discarded as useless. In the cases

associated with a weak, irregular, and rapid pulse we must have the pulse strengthened, slowed, and rendered more regular. In the cases associated with dropsy we trust to digitalis as the most important diuretic. It is usually combined with citrate and acetate of potash, but there is no doubt that the action of digitalis on the heart is the important factor in producing diuresis. I have recently seen some very striking effects produced in cardiac dropsy by the combined action of digitalis and theocine-sodium-acetate in cases brought to my notice by Dr. Hayes when he was Resident Medical Officer at the North-West London Hospital. One girl had been bedridden for months, and although she had taken digitalis regularly all through the illness, the abdomen had been tapped some ten times in all and oedema of the extremities was persistent. The effect of adding theocine to the digitalis mixture was that the dropsy passed off entirely from the extremities and the abdomen through free diuresis, and it was proved that this good result could only be maintained by a combination of theocine and digitalis and not by either of them alone. This drug therefore appears to be deserving of further trial in cases of cardiac dropsy which do not yield to digitalis and ordinary diuretics. Viewing digitalis as a cardiac tonic one must not discontinue the drug as soon as marked symptoms have been relieved, but must continue it for some weeks, in diminished doses, and more

especially until the cardiac condition has been tested by the patient's state when out of bed. In some cases of chronic cardiac disease in children the continuous use of the drug may be absolutely necessary in order to prevent signs of cardiac incompetence developing.

Attacks of **Pericarditis** are not infrequently met with in the subjects of chronic cardiac disease. The symptom which directs attention to this condition is pain in the praecordial region. For the relief of both pain and inflammation Dr. Lees recommends the continuous application of an ice-bag to the praecordial region. As children frequently react badly to extreme cold the effect must be carefully watched. The application of two or three leeches will often quickly relieve the pain.

In more severe cases opium or morphia should be given in full doses, not only for the relief of pain but also to remove the restlessness and sleeplessness which tend to exhaust the patient. As an attack of pericarditis is often an indication of active rheumatic trouble it is advisable to give a course of salicylate treatment, as in rheumatic fever, and to combine with the salicylate small doses (2–3 grs.) of iodide of potassium. This treatment will also be found useful in cases of pericarditis with serous effusion, the amount of which is usually moderate.

Purpura.—In children, as in adults, purpura may be a symptom of some grave underlying disease such as the malignant type of specific fevers, Bright's disease, extreme cachexia, scurvy, etc., and as such does not call for any special notice. There are further in children certain conditions in which purpura, simple or haemorrhagic, may be the leading symptom and indication for treatment. Amongst these the so-called "Henoch's purpura" is of considerable importance.

Henoch's Purpura is by some considered to be a variety of erythema exudativum multiforme, and by others is classed amongst the angioneurotic oedemas. The affection runs a prolonged course, of many months in some cases, but commences suddenly without obvious cause or antecedent illness. It is characterized by recurrent attacks of haemorrhage in the skin, the stomach, the intestines, and the kidneys; by severe colicky pains; by vomiting and diarrhoea; and sometimes by pains in the back, limbs and joints. It terminates usually in recovery, rarely in death. The symptoms affecting the alimentary tract are always of a marked character. The abdominal pain is severe and griping, and is referred to the umbilical, the epigastric, or the right inguinal region. Sickness soon follows, and frequently the vomited material is blood-stained, or consists of pure blood. At first constipation is marked, but in a few days diarrhoea

sets in, the motions are offensive and blood-stained, and soon pure blood is passed by the bowel. Such an attack may last for a few hours or a few days, and is followed by a gradual remission of the symptoms until the next attack. The importance of this affection lies in the fact that from the predominance and acuteness of the abdominal symptoms, various surgical diseases calling for immediate operation have been diagnosed, and laparotomy has been performed. Amongst these erroneous diagnoses may be mentioned intussusception, appendicitis, perforated gastric ulcer, peritonitis, and acute intestinal obstruction. The mistake is pardonable from the nature and acuteness of the symptoms, but it is none the less desirable to avoid it. This may usually be done if the possibility of Henoch's purpura be kept in mind, if the extent of the visceral haemorrhage and the other abdominal conditions be duly considered, and if the skin be carefully examined for purpuric spots. These spots appear most frequently and copiously on the extensor surfaces of the elbows, knees, and hips, but may be found on any part of the body.

The symptoms in Henoch's purpura pointing to some toxic condition of unknown origin, the **treatment** must be palliative. The patient should be kept in bed and fed on a light and restricted diet of milk and barley water, Benger's food, and simple soups. During the acute stage, when vomiting is

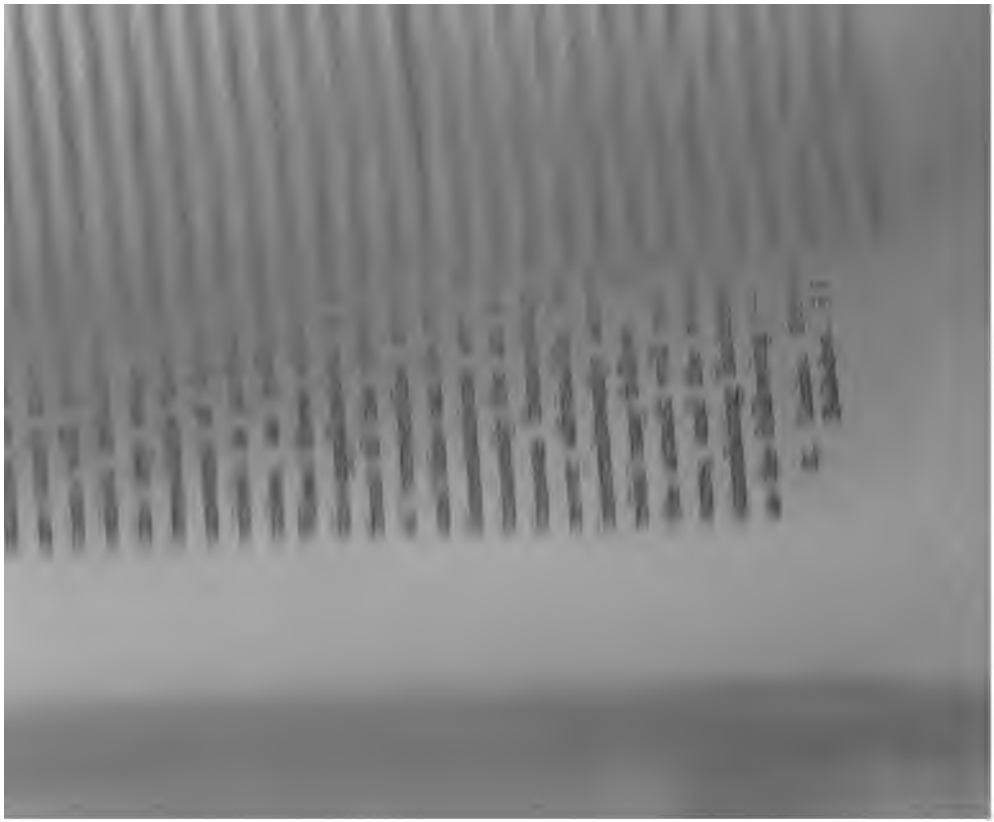
severe and all appetite is lost, the less food given the better. The local treatment should consist of an ice-bag or cold compresses to the abdomen. Hot applications are not to be used, as they may induce further bleeding in the bowel or the abdominal wall. The medicinal treatment consists in clearing out the intestinal tract by small doses of castor oil or sulphate of magnesia, and by relieving the abdominal pain with opium (liquor opii sedativus, 5 minims every four hours until relief is obtained). In the more severe cases of colic, morphia (gr. $\frac{1}{25}$th) should be administered hypodermically. The attacks are apt to recur, and nephritis may be a complication which calls for prolonged treatment.

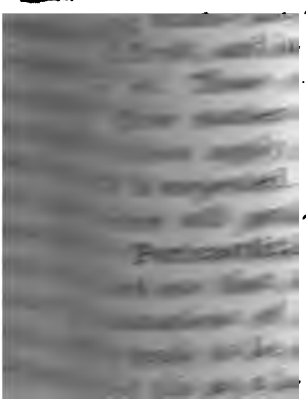
Another form of purpura is sometimes met with in poorly nourished, badly fed, and neglected children. The patient is usually distinctly anaemic, languid, and disinclined for exertion. Purpuric spots will be found scattered over the skin, and there may be a history of epistaxis or bleeding from the mouth or bowel. Physical examination may not reveal any definite visceral or other disease. Although one may not obtain any characteristic signs of scurvy in such cases, the affection would appear to be of that nature. In some cases one learns that the patient has been disinclined to eat fruit and vegetables all his life. The diagnosis of a scorbutic tendency is often justified by the results

of treatment. The patient should be kept in bed until convalescence is fully established, as the risk of sudden cardiac failure is always present in these cases. A simple diet should be ordered consisting of meat, vegetables, and puddings, and the juice of one or two oranges should be given daily. A saline mixture may be ordered consisting of magnesium sulphate (℥ ss.) and calcium chloride (grs. v), in order to check the haemorrhagic tendency and prevent constipation. In the later stage the tincture of the perchloride of iron may be given in full doses (♏. x–xv, T.D.S.) to improve the anaemic condition which is apt to be persistent.

For certain **Idiopathic forms of purpura** one can trust only to empirical treatment. Amongst the drugs which may be tried are calcium chloride or lactate (gs. v–x), adrenalin solution (♏ v–x), turpentine, and ergot.

Anaemia in infancy and childhood is usually a symptom of some local or general disease. It is advisable therefore not to commence the treatment with some preparation of iron, but to examine carefully as to the cause of the anaemia. In infants a peculiar lemon-yellow colour of the skin is frequently seen in empyema, while a waxy pallor, with a yellowish tinge, is characteristic of splenic anaemia. Anaemia is also a striking symptom in





many cases of hereditary syphilis, tuberculosis, rheumatism, and cardiac disease. The treatment in such cases must be directed to the underlying disease. The subjects of chronic gastro-intestinal catarrh are apt to be anaemic, and too often the anaemia is treated by giving more food and iron in the belief that the child is suffering from debility. The treatment should be to restore the proper functions of the alimentary tract by a spare and simple diet, by aperients, and by a course of alkalies and nux vomica. When the digestion is improved the blood condition will soon right itself. In other cases some affection of the blood, such as leukaemia, may be the cause of anaemia.

In the absence of any definite underlying disease special treatment may have to be directed to the anaemia. An anaemic child is a languid and tired child, and the best results will often be secured by keeping the patient at absolute rest in bed for a fortnight or longer. There should be as much fresh air and sunshine about the patient as possible, and whenever possible the open air treatment should be carried out. During the resting period massage to the trunk and extremities should be employed, for half an hour twice a day, so as to maintain the digestion and nutrition. A simple diet should be ordered in which raw meat juice, underdone beef and mutton, oatmeal porridge, eggs, fruit juices, and green vegetables play an important part. Green vegetables contain a con-

siderable amount of iron in an assimilable form. As regards the quantity of food the appetite must be consulted and nothing but harm will follow from coaxing or forcing the child to eat more than he is inclined to. An ounce of port, or two ounces of claret, may be given daily in divided doses along with meals. Constipation must be corrected by the use of enemata, salines, cascara, or senna. It is surprising how many cases of anaemia in children are due entirely to constipation, and are cured by free evacuation of the bowels. In extreme cases one can detect by palpation faecal masses in the whole course of the colon. If there is any evidence of the presence of round or thread worms, calomel or santonin may be used.

The chief drugs in common use continue to be iron and arsenic, and as both of them are apt to disturb the digestion, it is desirable to hold them in reserve until the digestive organs are in a thoroughly healthy condition. For this reason also all syrupy preparations of iron ought to be avoided. In the case of rheumatic children the employment of iron is very apt to induce fresh pains. In the course of his practice every doctor settles down to use certain preparations of iron as the result of experience. For ordinary purposes in the treatment of anaemia an acid iron mixture, an alkaline iron mixture, and an aperient iron mixture will be found sufficient.

MISTURA FERRI ACIDA.

℞ Liquoris Ferri Perchloridi . . . ♏ v
Acidi Hydrochlorici diluti . . . ♏ iss
Glycerini . . . . . ♏ x
Infusum Calumbae ad . . . . ℥ i
Sig. ℥ j.—T.D.S.

MISTURA FERRI ALKALINA.

℞ Ferri et Ammonii Citratis . . grs. iii
Sodii Bicarbonatis . . . . grs. v
Glycerini . . . . . ♏ x
Aquam ad . . . . . ℥ j
Sig. ℥ j.—T.D.S.

MISTURA FERRI APERIENS.

℞ Ferri Sulphatis . . . . . grs. i–ii
Magnesii Sulphatis . . . . grs. x
Acidi Sulphurici diluti . . . . ♏ ½
Glycerini . . . . . ♏ x
Aquam ad . . . . . ℥ i
Sig. ℥ j.—T.D.S.

The above are suitable for a child of five years. To these may be added reduced iron which Dr. John Thomson finds a convenient form for administration in doses of gr. ½ to j, thrice daily after food. "Haemaboloids," a proprietary preparation, has appeared to me to be sometimes useful in cases of anaemia, and especially those associated with cardiac disease. The preparations of haemoglobin and of bone marrow have not in my hands proved efficacious. Dr.

Hutchison has found the combination of iron and oil in the form of "Ferroleum" very useful. Arsenic should be administered in small doses, well diluted, and immediately after meals. In doses of one to two drops of Fowler's solution it will often improve the appetite, but in larger doses gastric disturbance is apt to follow. A quinine and iron mixture is an old institution, but it is doubtful whether quinine is of any special value in the anaemia of childhood.

Splenic Anaemia is a special affection of infancy. It is characterized by progressive anaemia, enlargement of the spleen, certain changes in the blood, and wasting. The condition may occur in syphilitic or rachitic infants, but does not appear to be directly associated with either of these affections as judged by the results of treatment. It is believed by many to be due to some chronic infection from the bowels. There is no direct curative treatment, but if the infant's health can be maintained through the prolonged course of the illness, and intercurrent disease avoided, the prognosis is good, as many cases ultimately recover. The dietetic and hygienic surroundings should be carefully regulated. Often a complete temporary change of diet will be serviceable, e.g. from milk and puddings to meat and vegetable soups, chicken soup, and plasmon. Special attention should be directed to maintaining a healthy condition of the alimentary tract. The

infant should have as much fresh air and sunshine as possible. Iron in small doses may be given, in the form of the Mistura Ferri Alkalina or the Mistura Ferri Aperiens.

CHAPTER VII

DISEASES OF THE NERVOUS SYSTEM

FUNCTIONAL NERVOUS DISORDERS; NEUROSES—NEURASTHENIA — CONVULSIONS — EPILEPSY — NIGHT TERRORS—ORGANIC DISEASES; MENINGITIS—HYDROCEPHALUS—CEREBRAL PALSIES —ACUTE ANTERIOR POLIOMYELITIS —CRETINISM.

Functional Nervous Disorders.— There is a class of young patients frequently met with in whom the nervous equilibrium is not temporarily and occasionally disturbed, but seems to be chronically upset. Children of this type are described by their parents as nervous. They are emotional, excitable, active, precocious, with restless bodies by day and restless brains by night, capricious in their likes and dislikes, passionate at one time, affectionate at another, and at all times the chief regulators of the domestic peace and comfort. They seem to be constantly hovering on the borderland between health and disease, never being decidedly in the former territory, but passing very frequently and

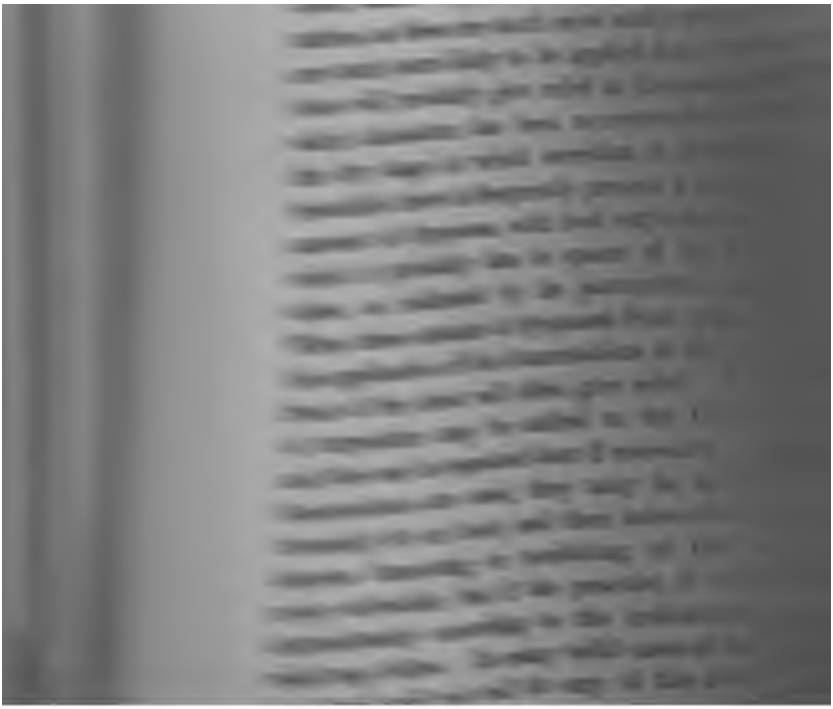
very easily into the latter. When attacked by acute disease they present manifestations which are not in the regular order of things, and they respond to drugs in a way which puzzles the practitioner. This nervous diathesis is manifested in various ways and amongst others by local disturbances of function, which are known as neuroses or hysterical manifestations.

These **Neuroses** may take many different forms. There may be functional aphonia, or functional tremor, or a spastic contraction of one limb, or functional paraplegia, or functional dysphagia, or functional spinal or hip disease. The attack may come on after some definite illness, or after an injury, or after a fright or shock of some kind. In other cases there is no apparent exciting cause.

The factors predisposing to such functional disturbances are both hereditary and acquired. There will often be found a history of nervous disease, of gout, or of rheumatism, in one or both parents. The acquired tendencies depend on the special diathesis of the child, influenced by its diet, its upbringing, and its home surroundings generally. Although some forms arise in very early life, such neuroses most frequently occur during later childhood, from the age of nine up to fourteen years.

The most important part of the **treatment**, and the most difficult to carry out, is the removal of the child from its parents and home surroundings.

The home treatment usually consists in effusive sympathy, overfeeding, and a constant giving in to the whims of the child. Consequently it is extremely difficult to carry out a firm line of treatment at home. The next best thing to isolation away from the parents is to put the child under the charge of a trained nurse, and to give her strict injunctions as to the treatment to be pursued. The child is to be encouraged to use his mind and body, talking about ailments and complaints about pains are to be discouraged, and the mind is to be kept engaged on pleasanter and more profitable topics. When the system is run down and the muscular power weakened massage is to be employed, especially after cold bathing or cold sponging. In all cases of general debility electricity in the form of faradism is beneficial. It is to be employed at first mildly as a general tonic, but a stronger current is often required locally so as to add the stimulus of pain to that of muscular action. In all the measures employed care must be taken not to frighten the child and possibly increase the nervous disturbance already existing. But firmness, gentleness, and patience will enable one to carry out strong measures without injury. Attention should be paid to the strengthening of the nervous system by a simple non-stimulating diet in abundance and plenty of open-air life. Lessons should not be made a burden, and competitive work should be forbidden. Nervine tonics, such



as nux vomica, strychnine, and cod liver oil with hypophosphites, are also useful.

Life at a boarding school has the advantage of removing the patient from the home surroundings, but has the disadvantage of being rather trying to a child with such a nervous temperament. A private school with a limited number of pupils where each child can receive the special care and attention necessary is better suited for such cases. At the same time fond parents must be warned against regarding and treating the child as delicate, and are to be advised as to the advantage of teaching the child a virtue which they often do not possess themselves, namely, self-control. Relapses are so common amongst children of this type, or the development of some other neurosis, that careful attention must be devoted to the child's general treatment, and not merely to the curing of an attack.

The **local treatment** of the various local manifestations is important. Functional aphonia will usually be rapidly cured by faradism, one pole being placed on the back of the neck and the other over the larynx. The strength of the current is gradually increased until the patient cries out, and then he can usually be induced to say some words in a clear voice. He is to be encouraged to do so, and if the voice fails again, the battery has to be again used. In paralytic lesions of the extremities massage and electricity are of great value.

In the case of the lower extremities it will often be found that the patient can perform powerful movements with the limbs when in bed, but all muscular power vanishes as soon as he tries to stand or walk. But with encouragement and support the use of the limbs in the erect posture can be steadily improved. Functional tremor is usually confined to one limb and is present only when the patient is under observation. The local application of faradism to a painful extent is usually curative. In the case of all these local lesions it is very important to exclude the possibility of organic disease, and this can usually be done by a careful examination, conducted under an anaesthetic if necessary.

A condition corresponding very closely to the **Neurasthenia** of adult life is of common occurrence in children between the ages of nine and fourteen years. There is also in such cases a history usually of nervous disturbance in the parents. Frequently what may be called the more active symptoms of neurasthenia are developed by the strain of school life. These children are the subjects of mental over-strain, and the result is a nervous breakdown. They deserve all our sympathy and careful treatment, for the disorder is a very real and a very trying one. The child complains of tiredness, becomes dull and apathetic, cannot keep his attention fixed at school, cannot remember his lessons, and becomes upset in consequence. Crying fits are

common, and the control of the emotional centres is in abeyance. The tired and worried expression of the face becomes fixed. Physical examination will usually yield confirmatory evidence of the general atonic condition which exists. The heart sounds are weak, the pulse is extremely small and feeble, and the extremities are usually cold and blue. Fainting attacks, palpitation, and tachycardia are easily induced. Albuminuria is often present, of the orthostatic variety, i.e. the albumen only appears after the patient has been walking about, and is unaccompanied by any signs of organic disease. The stomach and bowels are atonic and dilated, and constipation is usually a marked feature. Headaches, backaches, and other aches of uncertain origin are often complained of. In addition to the chronic condition, nerve storms arise occasionally in the form of prostrating sickness and headache, sleeplessness, and moderate delirium.

The **treatment** of such cases presents many difficulties. The following negative indications may be borne in mind :—

1. Do not tell the parents that there is nothing to be done and that the child will outgrow it.

2. Do not give iron and arsenic until the appetite is in a healthy condition, and then they will probably not be required.

3. Do not diagnose nephritis from the presence of albuminuria, give a bad prognosis, and treat the case as one of Bright's disease.

4. Do not tell the parents that the child has a weak heart and must never be contradicted or excited in any way.

5. Do not imagine that the patient will be cured in a day with a dose of calomel or castor oil.

The case must be treated as one of nervous breakdown and the improvement can only be slow. The exciting causes of the disturbance must be removed, and amongst these school lessons take the first place. School authorities do not recognize that a child may be suffering from school life and incapacitated thereby for school work. The first essential, however, in such cases is to stop school for three or six months or as long as the condition persists. Sometimes even the home life, in a family of boys and girls, is too trying for the over-strung nervous system. In such cases the best treatment is to send the child to some aunt or grandmother in the country, where he will not be associated with other children. All the excitements of child life, such as parties, theatres, &c., must be strictly forbidden. In severe cases of prostration a course of Weir-Mitchell treatment—rest, isolation, feeding-up, and massage—will yield the best results. An important thing is to secure sleep, which in many of these sufferers is often restless and broken. With the absence of worry, sleep will often come naturally, but unless this is so ten to twenty grains of bromide of ammonium may be given at bedtime. It is advisable to devote two hours during the day

to rest and sleep, and at least ten hours during the night.

The diet must be carefully regulated, but it is not necessary to reduce these children still further by a course of beef essences and tinned foods, which is frequently the home treatment. All stimulants such as tea, coffee and alcohol should be strictly forbidden, as they invariably do harm in such cases. Spicy and highly seasoned foods and rich sauces are to be avoided. The patient should be put on a good mixed diet of meat, fish, eggs, vegetables and puddings. One or two pints of milk may be taken daily with much benefit, but the amount of the diet must be regulated in accordance with the state of the appetite. Constipation must be relieved by enemata and cascara, senna, or castor oil, and as the underlying condition is atony of the bowel, a course of abdominal massage will prove useful. Acute attacks of abdominal pain call for local soothing applications, rest, and low diet, but are usually of short duration. In the case of severe headaches one can employ small doses of antipyrin (grs. iij to iv) or phenacetin (grs. iij to iv) with benefit, but the prolonged use of such nervine sedatives is distinctly injurious to the already weakened nervous system. The cardiac condition and the albuminuria do not call for special treatment, as both are dependent on the vasomotor instability present in this affection. As a routine treatment

the chief indications will be usually best met by a prescription such as the following :—

℞. Tr. Nuc. Vom., ℥ v ; Sodii Bromidi, grs. v ; Extr. Cascar. Sagr. Liq., ℥ x ; Syr. Pruni Virgin., ℥ x ; Aquam ad ʒ ij.— T.D.S.

This may be taken at intervals for a period of two or three months. The treatment of the affection will in all cases be prolonged, and recurrences will take place if the child is again exposed to mental worry and strain.

Convulsions. —During the early years of life there is a marked tendency to convulsive seizures owing to the unstable equilibrium of the actively developing nervous centres. Nevertheless it may be taken for granted that a healthy child reared under proper dietetic and other surroundings will not be the subject of fits. Like too many other disorders of childhood convulsions have come to be regarded by a certain portion of the laity as almost normal occurrences. This view must be strongly combated. For clinical purposes one has to divide convulsions into two classes, the functional and the organic. In the organic class there is some gross underlying cerebral or meningeal disease, such as meningeal haemorrhage, meningitis, cerebral tumour, encephalitis, &c. Such cases are to be recognized from the presence of the accompanying

symptoms and require treatment directed to the primary disease. Functional fits are those associated with some temporary cortical irritation, and the treatment is to be directed to relieving this irritation, first by sedatives and secondly by removing the source of irritation. If the child has been under medical observation beforehand, one will often find indications of cerebral irritation in the slight fibrillary or muscular twitching about the eyes and mouth and fingers, a condition of cortical excitability which is not physiological. In such a case by regulating the diet, by aperients, and by rest, one may succeed in preventing any further developments. During the first two years of life —when fits occur most frequently—one will find three agents predominating amongst the etiological factors. These are (1) a nervous temperament, (2) gastro-intestinal disturbance, and (3) rickets.

The first thing to be considered is the **immediate treatment** of a convulsion, which comes usually like a bolt from the blue. Mild measures may sometimes succeed in allaying the disturbance. Amongst these the hot bath is credited with great virtues by the laity and may be recommended. The child should with as little disturbance as possible be put in a hot bath (100° F.), left there for two or three minutes, dried quickly with a warm towel, and put to bed rolled up in hot blankets to encourage sweating. More effective and less disturbing is the hot pack, in which the child is rolled in a hot wet blanket

for five or ten minutes, until the skin is thoroughly reddened, and then rolled in a dry hot blanket. There should be as little fussing about the child as possible, and to secure quiet all friends should be put out of the room and only a placid nurse left. If the fit does not yield to this treatment, or recurs quickly, a rectal injection of chloral (grs. v) and potassium bromide (grs. x) may be administered in an ounce of warm water to an infant of twelve months. The dose may be increased or diminished according to the age of the child. Before this is given an enema of soap and water should be administered, both for the relief obtained by an evacuation and the preparation of the rectum for the medicinal injection. If the fits are severe or continuous the best remedy to employ at once is chloroform, a few whiffs of which will usually be effectual. This can be repeated if necessary until the chloral and bromide have had time to act. Sometimes instead of chloroform the inhalation of nitrite of amyl may be tried, and continued until the face becomes flushed. Although this acts like a charm in some cases, the result is uncertain and it is impossible to say beforehand in what cases it is likely to succeed. Some writers recommend the use of morphia by the mouth or hypodermically, in doses of $\frac{1}{25}$th or $\frac{1}{50}$th of a grain. Although this is undoubtedly effective in stopping convulsions it should only be used as a last resort, for the after effects of morphia may hamper a complete cure.

Having secured a temporary cessation of the fits one has time to examine into the **nature of the exciting cause.** It will often be found that a large meal or some indigestible food had been taken, and had been followed by signs of gastric discomfort. An emetic is called for and one or two grains of sulphate of copper in two drachms of water should be given. An abdominal examination will frequently reveal signs of intestinal disturbance in the form of flatulence, faecal accumulation, &c., and two grains of calomel should be administered as soon as possible, or one grain each of calomel and jalapin. The temperature should be taken, and if there is found to be definite pyrexia the onset of some acute illness such as tonsillitis, pneumonia, infectious fever, &c., may be suspected and a careful examination is called for. In some cases one will find a wasted, starved, and neglected infant in a collapsed condition, and suffering from the convulsions of debility. Here the proper treatment is stimulation by means of brandy and hot milk. There will often be found signs of rickets in an acute stage, and these indicate the underlying disease which must be treated.

The **further medicinal treatment** of a case of convulsions consists in the use of chloral and bromide. For an infant of twelve months two grains of chloral hydrate and five of bromide of ammonium may be given by the mouth every six hours for twenty-four hours, or until the patient

becomes drowsy. The dose should then be reduced by one-half, and continued until the convulsions have been absent for two days. It is necessary of course to watch the action of these drugs, but it is also necessary to push them so as to check the convulsive tendency as quickly as possible. An attack which begins apparently in a simple convulsion may become so severe as to affect permanently the nervous centres, as shown subsequently by mental defect or cerebral paralysis. The risk of such permanent damage is to be measured by the duration and the severity of the fits. In the case of delicate infants convulsions may prove directly fatal, quite apart from the presence of other acute disease. Another unfortunate fact about convulsions is the tendency to recurrence, sooner or later, unless one follows up the immediate treatment by attention to every detail in the infant's life.

Epilepsy.—The treatment of epilepsy is similar to that pursued in later years. Attention must be paid to any source of peripheral irritation, such as nasal obstruction, errors of refraction, phimosis, &c., but the removal of these does not cure epilepsy. The most that can be claimed is that it allows of other special treatment being carried out with a better prospect of success. The home surroundings are very important, and the diet, hours of sleep, and mental work must be carefully regulated so as to prevent any unnecessary strain or disturbance of

the nervous centres. If school life is a pleasure and not a worry to the child it may be allowed, but the strain of competitive work should not be permitted. A healthy brain will be best secured by developing a healthy body. The diet should be plain and wholesome, and all substances like tea, coffee, and alcohol should be forbidden. If care is taken that the child is not overfed, and that too much meat is not given, it is unnecessary to draw up a hard and fast dietary. As regards the drug treatment, the bromides are regarded as the most reliable remedy and the dosage must be regulated by the frequency and severity of the fits. Children tolerate the bromide treatment well and from ten to fifteen grains of bromide of potassium may be given three times daily to a child of ten years. When large doses are being given it is as well to use equal parts of the three bromides, potassium, sodium, and ammonium, as being less depressing. In prolonged cases the treatment should be intermittent. When the convulsions are nocturnal it is advisable to give the daily amount of bromide in one dose at bedtime. When the bromide in any of the above forms is followed by troublesome acne Dr. James Taylor advises the use of bromide of strontium. The occurrence of a peculiar and persistent bromide rash in infants and children, even when small doses are being given, is sometimes met with and calls for a cessation of the treatment. Nervine tonics should be combined with the bromide treatment, and of these the best are strychnia, the

hypophosphites, and cod liver oil. In some cases the efficacy of the bromide may be very much increased by the addition of chloral hydrate in full doses. This is specially valuable when the fits are frequent and severe and the affection may be regarded as in an acute stage. The patient should be kept in bed and for a child of eight years the following may be ordered.

℞. Sodii Bromidi, grs. xx ; Chloral Hydratis, grs. x ; Tincturae Nucis Vomicae, ℥ v ; Tincturae Zingiberis, ℥ x ; Aquam ad ℥ ss.

This may be given every six hours for the first two days and twice daily for five days more, the dose being diminished if the patient is very drowsy. An interval of two days may then be allowed without any medicine, and a second course given afterwards if necessary. The important point is to push the chloral treatment until the fits have been stopped, and then to keep up the effect for some time longer with reduced doses until the habit has been entirely broken.

Night Terrors.—This is a source of very real suffering to many children who have passed the age of infancy. The subjects of the disturbance are usually excitable, nervous children, whose upbringing has not been of the wisest kind. The child goes to sleep quietly and wakes up suddenly in a state of extreme fright and screaming loudly.

In some cases it is only from "dreaming dreams" that the terror comes, the child being quite unable to say what the cause of alarm is. In other cases they "see visions," and in the half-awake condition will point to some imaginary object or animal, or will describe the horrible apparition which has been seen. The attacks may be repeated at intervals of a few days or weeks, or may be of nightly occurrence. The recurrence of the attacks may produce in the child a dread of the dark or of sleeping alone, in which case some one must remain in the room, or a light should be kept burning, until the cessation of the trouble renders such measures unnecessary.

In the **treatment** of this condition one must consider the two chief factors, which are, first, an unstable and disturbed nervous system, and, secondly, some peripheral irritation, which is most frequently found in the alimentary canal. The state of the nervous system must be attended to, and a quiet home life without excitements and without overstrain of any kind must be secured. Suitable nervine tonics should be given, and the diet should be plain and spare. It will often be found that the dietary has been at fault, and that a condition of acute or chronic intestinal catarrh is present. This must be treated by a simple diet, without overfeeding, and by laxatives administered regularly (*vide* Chronic Intestinal Indigestion). In many cases when the stomach and bowels are restored to a healthy state the night terrors will cease. Another

source of disturbance is sometimes found in the naso-pharynx from overgrowth of adenoid tissue or the tonsils. The obstructed breathing leads to broken rest, and night terrors may supervene in the form which is sometimes described by the patient as "suffocating dreams." It will be necessary to secure the patency of the upper respiratory passages in order to relieve this condition. While such measures are being taken to remove any peripheral irritation, the comfort of the child may be secured by a dose of chloral hydrate (grs. v to x) and ammonium bromide (grs. x to xv) at bedtime. Dr. Leonard Guthrie finds that in addition to the above form of night terrors, which may be termed symptomatic, there is another in which no source of peripheral irritation can be found, and which is apparently idiopathic. In cases of this variety one must tone up the nervous system in every possible way, at the same time giving bromides in moderate doses for a prolonged period if necessary.

Meningitis.—The two forms of meningitis which call for notice are tuberculous meningitis and posterior basic meningitis.

Tuberculous Meningitis is usually secondary to some tuberculous lesion in the body, such as a caseous gland, and is almost invariably if not always fatal. Surgical measures for the relief of the patient have proved useless and no specific medical treat-

ment is known. Frequently children to all appearance in the best of health are attacked, the pre-existing tuberculous focus having produced no symptoms and having been unsuspected. The preventive measures to be taken are those for tuberculosis generally. The most that can be done in the way of treatment after the onset of meningitis is to keep the patient as quiet and comfortable as possible. Symptoms like restlessness, headache, and convulsions are to be relieved by cold to the head, phenacetin, and bromides. Simple dieting should be carried out, and when swallowing has become impossible in the last stage it is no kindness to try to prolong life by forced feeding and stimulation.

Posterior basic meningitis is chiefly met with between the ages of six and twenty-four months. It is to be regarded as the infantile type of cerebro-spinal meningitis, as evidenced by the presence of the same organism in both diseases (Still). The chief symptoms are head retraction, vomiting, fever, and convulsions. The disease may run a prolonged course for several months and yet end in recovery. On the other hand many of the cases which survive are crippled by mental weakness, hydrocephalus, or some form of paralysis.

Our knowledge of the preventive treatment of the disease is very limited. It would appear probable that in many cases the specific organism

finds an entrance from the nasal passages, either directly through the base of the skull, or by the Eustachian tube and middle ear. This suggests the importance of maintaining a healthy condition of the nasal passages in infancy.

When the disease has shown itself attention should be directed to cleansing the nostrils and post-nasal space daily with an alkaline lotion (borax and bicarbonate of soda, grs. ij of each to one ounce of warm water). The ears should be examined, and if the membrane is bulging it should be freely incised, and irrigation should be carried out twice daily. Sometimes very striking results follow the relief of tension in the middle ear, in conditions which are described as due to basilar meningitis. It must be remembered, however, that the leading symptoms of basilar meningitis, such as vomiting, head retraction, and fever, may be due entirely to fluid pressure in the middle ear, and the rapid disappearance of all the symptoms after paracentesis makes one suspect that the disease had not really extended to the meninges. In one case of basilar meningitis under my care there was suppuration in both ears, and Mr. Hunter Tod performed the radical mastoid operation on both sides. The patient eventually made a good recovery from the meningitis, but I could not convince myself that the course of the illness was appreciably affected by the operation on the ears. During the course of the illness a purulent nasal discharge very frequently develops

and the inflammation spreads to the eyes. The value of the early adoption of nasal treatment in preventing this is evident. Any sores developing about the face or the back of the head must be kept scrupulously clean, and covered with weak white precipitate ointment (one part in six of vaseline). The child must be kept at rest in bed, washed twice a day in warm water, and any parts exposed to pressure or friction from the tonic rigidity which is often present, should be wrapped in cotton wool. The bowels ought to be carefully regulated and in this affection mercury, with or without castor oil, is the most useful drug, from its additional effect in reducing inflammation. One grain of grey powder with four grains of bicarbonate of soda may be given twice daily for some weeks. If the child is in constant pain from the rigidity of the muscles, one does not hesitate to give opium (half-minim doses of laudanum, or half-grain doses of Dover's powder) and to continue until relief is obtained. If the pain seems to be localized about the head, one or two leeches may be applied over each mastoid region.

The food should be simple and nourishing and regular feeding must be observed. Wasting is one of the marked features of the disease, and must be counteracted as far as possible by the fullest diet possible without disturbing digestion. Milk and barley water will naturally be the diet during the pyrexial stage, and afterwards cream, cod liver oil,

Mellins' food, and simple pudding may be added if the infant is old enough. If swallowing becomes difficult, and sufficient nourishment be not taken naturally, feeding by the stomach tube may be employed regularly. No direct treatment by means of drugs seems to be of any value in this disease. While bromide may be given for restlessness or sleeplessness or convulsions, no marked benefit has yet been traced to the use of iodides.

One often obtains early in the disease, and always in the course of it, evidence of an increase of cerebro-spinal pressure. The increase of the spinal pressure is manifested by lumbar puncture, when an excessive amount of fluid under abnormal pressure is obtained. Similarly the raised and tense anterior fontanelle indicates an increase in cerebral pressure. As probably a good many of the symptoms are traceable to these two conditions it has seemed advisable to keep down the pressure as far as possible. The simplest method of doing so is by means of lumbar puncture, with which must be combined in certain cases puncture of a lateral ventricle in the brain. In performing lumbar puncture one employs a medium-sized needle, such as is used in exploring the chest, which has been carefully sterilized. The depth at which the arachnoid sac is reached is usually from one to one and a half inches, so that a stout needle two inches long is necessary. The skin over the lumbo-sacral region should be thoroughly sterilized with soap and

water, and then ether. One blanket should be wrapped round the upper part of the body, fixing the arms, and another round the lower part, fixing the legs. The patient may be lying in bed on his side, with the spine flexed, or across the nurse's knees. The site of puncture is determined by drawing a line between the highest points of the iliac crests. This line crosses the tip of the fourth lumbar spine and the spot for puncture is immediately below this. Having marked the tip of this spine, the operator inserts the needle slightly below and to one side and pushes the needle firmly forwards and towards the mid-line of the body. Some resistance may be encountered at the ligamentum subflavum, but this yields to firm pressure and the point of the needle is felt to enter a cavity. If bone is struck the needle must be partly withdrawn and again pushed forward in a slightly altered direction. If bone is again struck, the needle may be withdrawn and entered on the other side of the spine. When the point enters the arachnoid cavity, fluid will flow through the needle at a rate varying with the amount of pressure present. In the case of young infants an anaesthetic is not necessary. In the case of infants over eighteen months the skin may be frozen with ethyl chloride. In the case of very timid and excitable children chloroform may be advisable. The fluid is allowed to flow until all tension is relieved, and when it begins to come in drops the needle may be withdrawn.

The tapping should be repeated at regular intervals and it will usually be found that once in three or four days is sufficient. The best guides are the amount of fluid which is obtained, the tension under which it exists, and the relief or amelioration of the symptoms which follows tapping.

Sometimes the cerebral pressure also will be relieved by lumbar puncture, i.e. when the outlet from the ventricles is not blocked. In other cases this relief is not obtained, and then it is advisable to tap the ventricles directly through the outer angle of the anterior fontanelle. A medium-sized exploring needle is pushed downwards and outwards through the scalp and membranes and brain into the lateral ventricle and the fluid is allowed to flow until the pressure is relieved. In cases where the fontanelle is closed, it is necessary to trephine first. This relief of pressure from increase of cerebro-spinal fluid, either by lumbar puncture alone, or in combination with ventricular puncture, has appeared to me to tide the patients over the critical stage of the illness in several cases. More elaborate surgical procedures such as tapping and draining the fluid at the base of the brain, by trephining and raising the cerebellum, have not proved successful owing possibly to the difficulty in maintaining continuous drainage.

Hydrocephalus.—From the clinical point of view cases of internal hydrocephalus in infancy may

be classified as congenital or acquired. The **congenital cases,** with the exception of a few due to maldevelopment of the brain, are traceable to a syphilitic lesion of the meninges. The same cause may also be at work during the first six months of life, so that the development of hydrocephalus at this age may, in the absence of other definite cause, be regarded as due to syphilis. It follows from this that mercurial treatment ought to be employed, and one will probably obtain better results from a full and persistent course of mercury in every case of hydrocephalus which manifests itself at birth or during the first six months of life, than from any other line of treatment. The dosage and methods of administration are considered in the chapter on Syphilis. Small doses of iodide of potassium or sodium may be given in addition, and more especially if one finds improvement taking place under mercury.

In the **acquired cases** of hydrocephalus, acquired that is after the age of six months, one finds that the most common cause is an attack of posterior basilar meningitis. The inflammatory adhesions at the base of the brain block the exit of fluid from the fourth ventricle, and distension of all the ventricles follows. Sometimes the preceding illness has been of so slight a nature that it is only by careful questioning that one obtains a history suggestive of an attack of basilar meningitis. There is no medical treatment for such cases. It is in this

class, where the lesion is a purely mechanical one and all active disease has ceased, that one hopes for success in the future if not in the immediate present by surgical means. Such measures as strapping, aspiration, and external drainage of the ventricles have frequently been practised, but have now fallen into disuse. Lumbar puncture will only be of use in those comparatively rare cases in which there is no blocking of the ventricles at the base of the brain; in all ordinary cases of internal hydrocephalus it is useless.

More recently an attempt has been made to maintain intracranial drainage, or as it is called in America auto-drainage, for the relief of hydrocephalus. After trephining and opening the dura mater, the surgeon takes a strand of catgut ligatures about three inches long and as thick as a piece of stout cord, pushes one end through the brain into the lateral ventricle, and passes the other under the dura mater. The latter is then stitched up tightly and the wound closed. By this means it is hoped that the excess of ventricular fluid will pass out along the drain and be absorbed from the subdural space. The difficulty is to maintain this drainage, for inflammatory adhesions quickly form between the brain and dura mater, and close up the artificial outlet. Other substances have been used for drainage, such as horsehair, decalcified bone tubes, and silver tubes, but so far very few completely successful cases have been recorded. Possibly in

time surgeons will be able to overcome the difficulties met with in carrying out the drainage.

After infancy has passed, hydrocephalus may arise as the result of new growths in the brain, meningitis, &c., but both the diagnosis and the treatment when the skull is completely ossified present great difficulty. The only hope for such cases is the relief of pressure by trephining and possibly by drainage.

Cerebral Palsies.—There are many acute and chronic affections of the cerebrum in infancy and childhood such as encephalitis, haemorrhage, tumour, abscess, &c., which call for treatment, but not of a kind in any way special to the age of the patient. Many cerebral affections leave behind a condition of paralysis affecting one or both sides of the body In such cases attention must be directed to the paralysis, and an effort made to maintain and improve the power in the limb or limbs. If only one limb is affected the young patient will tend to let it fall into disuse, and to employ only the other. This must be counteracted by tying up, in the case of the arms, the sound limb for some hours daily and encouraging the use of the affected arm. In the case of the legs the patient should be made to practise movements and to walk as much as possible. A condition of spasticity and permanent distortion tends to develop. This must be counteracted by massage and movement of the joints in the affected

limb once or twice daily. If necessary a splint should be applied to the paralysed limb at night, so fixed that the tendency to contraction is counteracted. In spite of regular massage, and passive and active movements, deformities may become fixed and relief by tenotomy may have to be employed. It is advisable to consider here several things, (1) will the operation of tenotomy secure a useful limb; (2) will the after treatment necessary to prevent a recurrence be available; and (3) is the child's mental condition such as to make the operation advisable? As regards the first question, there are cases in which the muscular weakness is so great that no amount of tenotomies will render the limb a useful one. As regards the second question, such tenotomies are usually called for amongst the poorer class of patients, and as the after treatment will often have to be prolonged and arduous, it is not worth while operating if this cannot be carried out. As regards the child's mental condition, amentia is often associated with cerebral paralysis, and the degree may be such as to render operation unavailing. If there is merely a certain amount of backwardness, and the child is capable of being trained to use the limb, then operation may enable the child to be more of a joy to himself as well as to others. If the treatment of cerebral paralysis is begun in the early days of the affection, and can be carried out thoroughly and continuously, along with good nursing, good food, and fresh air, then much may be done for

these paralytics. But in too many cases these are wanting, and crowds of helpless cripples are the result.

Acute Anterior Poliomyelitis.—If the view is correct that infantile paralysis is an acute infective disease producing certain vascular lesions in the cord, there is not any possible preventive treatment in the present state of our knowledge. Even the acute stage of the disease may produce so little general disturbance that no medical advice is sought until the paralysis of one or more limbs is discovered. During the acute stage the patient should be kept lying down in bed, a low diet of milk and water and simple pudding should be given, and the body and limbs should be carefully protected from any chilling. In many cases the patient is otherwise healthy and has seemed in the best of health at the outset of illness. If any organic weakness or marked debility is present, suitable treatment must be adopted. The child should be kept quiet, visitors and excitements of all kinds must be avoided, and as much sleep as possible should be secured. If localized or generalized pain and tenderness are present, phenacetin or bromide of ammonium given in small doses will usually secure relief, but in the more severe cases opium or morphia may be required. Elimination by the skin, the bowels, and the kidneys is to be encouraged.

After the acute stage has passed attention must be

directed to the paralysed muscles, but they should not be treated until all pain and tenderness have subsided. As a child's volitional movements bring into play most of the muscles of the body, the paralysis is readily detected, but special attention should be paid to the muscles of the back, thorax, and abdomen, as these are most easily overlooked. The child need not be kept in bed for more than a week after the subsidence of acute symptoms, and the general nutrition will be more easily maintained when the patient is out of bed. The most important part of the treatment is massage of the affected muscles, and to render this efficacious a trained nurse is essential. The muscles should be massaged twice a day for ten or twenty minutes, and if many groups of muscles are affected longer may be required. After the rubbing, the affected limb or limbs should be carefully bandaged in flannel, and if necessary cotton wool may be added. It is extremely important in such cases to maintain the warmth of the limbs affected, and special precautions are called for in infantile paralysis, owing to the coldness and blueness which rapidly ensue. During the first few weeks of treatment marked improvement may be expected, for many muscles are temporarily affected. At the end of a month one will probably know which muscles have been more seriously affected by the spinal lesion. Massage is to be persevered with for six months at least. If at the end of that time the condition of the affected muscles has been stationary

for a couple of months, then it is doubtful whether any further benefit can be expected from this treatment. If some improvement is going on, then massage should be persisted with as long as the improvement continues.

Electricity is frequently combined with the massage treatment. It must be remembered that at the age when infantile paralysis is most frequent, i.e. the first two years of life, electricity in the form which will be useful is an alarming and painful form of treatment, and one which it is difficult to carry out. Further, if given at all, it must be at the hands of one who is skilled. The purchase of a battery for use by home attendants is a waste of money. For these reasons the efficient administration of electricity is surrounded with great difficulty. Many cases do extremely well without it. The form of electricity to be used is the galvanic current, and it must be strong enough to excite contraction in the paralysed muscles. If the efficient administrator and the long-suffering infant be available, then a daily course of galvanism may be combined with the massage.

In many cases massage and electricity will fail to restore the function of certain muscles. As the result of this the opposing muscles gain the upper hand and contraction and deformity follow. In the case of the lower limbs the power of standing and walking may be seriously affected by the paralysis of certain muscles, while the others are in a suffi-

ciently healthy state to allow of progression. Such cases are amenable to surgical treatment by tenotomy, suitable splints, and possibly tendon transplantation.

Cretinism.—Cases of sporadic cretinism are not common, but the brilliant results of treatment justify a short notice. The best results are obtained when treatment is begun at the earliest stage of the affection, and the recognition of the earlier symptoms is therefore essential. The pictures in textbooks of the repugnant brutelike aspect of fully developed cretins are in many respects misleading, for in such cases the time for effecting a complete cure has passed, and although much can be done there will probably always remain a certain amount of mental and physical stunting. The earliest symptoms are an unusual lethargy and quietness about the infant, a slight puffiness about the face, a fulness of the tongue, a prominence of the abdomen, and constipation. The symptoms may appear, in the case of bottle-fed babies, within the first two months. If an infant without a functionally active thyroid is breast fed, the symptoms do not usually appear for some months after weaning. The treatment should be begun early by means of small doses of thyroid gland. Various preparations of the thyroid gland are on the market, but the dried extract is the most convenient form and seems to meet all the requirements. In the case of infants under six months of

age one may begin with one-sixth or one-quarter grain of the dry extract once a day. The plan of beginning with small doses at this age is rendered necessary by the fact that otherwise diarrhoea and other symptoms of poisoning may be easily induced in certain susceptible patients. Such diarrhoea is apt to prove most intractable and may prove fatal. Watching the effect closely one may increase the dose every few days up to one-half grain daily, and if under this dose the temperature is normal, the swelling of the body and tongue is diminishing, and the bowels are acting normally, one may continue for some time without further increase. Between the ages of six months and a year one can commence the treatment with doses of one-third grain and increase gradually to one grain daily. After a year one should begin with the same dose, but it may be increased up to one and a half or two grains daily. The important point is not to try to produce rapid effects, which are not unaccompanied by danger, but to secure steady improvement within the limits of safety. The results are certainly very striking, and the child who was previously a mental wreck and a physical monstrosity becomes again a healthy human being. When all the definite signs of the disease have been removed the next thing is to find the amount of thyroid extract which will prevent a recurrence. It must be remembered that in a case of cretinism the thyroid gland is rendered permanently functionless, and that the treatment must

be maintained through the rest of life. The dose which is necessary for this purpose may not be so large as that given during the active stage of treatment. It must be determined in each case by experience, and according to the age of the patient. In the case of children under two years, one grain every day or every second day will probably suffice. In the case of children from two to five years of age, one and a half grains every day or every second day will probably be sufficient, and so on. The cessation of treatment, even for a short time, will quickly lead to a recrudescence of symptoms. This fact, and also the necessity for lifelong treatment, should be strongly impressed on the parents. So thorough is the effect of thyroid treatment that little else is called for. In the early stages the child should be protected from cold, well nursed, and carefully fed. During the period of active cretinism the hold on life is feeble, and no risks should be run.

CHAPTER VIII

DISEASES OF THE GENITO-URINARY SYSTEM

ALBUMINURIA—HAEMATURIA—HAEMOGLOBINURIA —INCONTINENCE OF URINE—NEPHRITIS—PYELITIS—VULVO-VAGINITIS.

THE examination of the urine in infancy and childhood is of great importance both in aiding the diagnosis and indicating the treatment of numerous affections. Even in the earliest days of infancy there may be a discharge of **pure uric acid** or of **urates in excess** which causes acute pain, as manifested by restlessness and screaming. This condition is to be treated by giving alkalies and water freely. Citrate and acetate of potash may be ordered up to 12 grains in the day, well diluted with water. Contrexville water is believed by many to be specially effective in washing out the uric acid calculi in the kidney, and may be given freely. Pus in the urine in infants is most commonly due to pyelitis (*q.v.*).

An excessive amount of uric acid or urates or

oxalates is frequently found in the urine of children beyond the period of infancy. The condition may be temporary, as during any pyrexial illness, and more especially during rheumatic fever. This does not as a rule call for any treatment save the administration of fluids. It may be more persistent and associated with some form of anaemia, in which case the cure of the anaemia will be accompanied by the restoration of the urine to a healthy condition. An excess of uric acid is most commonly due to digestive disturbance, traceable to overfeeding or improper feeding. It is especially in neurotic children that the condition is present, but it is not advisable to lay too much stress on the so-called uric acid diathesis. While the type of child is easily recognized, it is more important to look after the dietetic habits than to treat a diathesis. Any excess, whether of proteids, carbohydrates, or fats, may induce the hepatic and intestinal disturbance which is responsible for the disorder, but as a matter of experience one finds that farinaceous foods and sugars are the chief offenders. The treatment consists in regulating the diet, if necessary making it a spare one for a time, and in strictly limiting the carbohydrates. The fondness for sweets so often found in such cases must not be encouraged. Water should be given freely between meals, and half a pint of Vichy or Contrexville water may be taken daily. The following medicine will also be found useful :—

℞. Tr. Rhei. ℥ x; Sod. Salicyl. grs. v; Potass. Citrat. grs. x; Tr. Zingib. ℥ v; Aq. ad ℥ ii.—T.D.S.

The state of the alimentary canal and liver will be improved by a dose of calomel (grs. ii), at intervals of a week.

Albuminuria is very often met with in children. It would appear that in them the passage of albumen through the kidneys is effected much more easily than in adults, and that the same significance is not to be attached to it. This is shown by the fact that while albuminuria is very common, the other evidences of organic renal disease are but rarely met with. One form of albuminuria is particularly common between the ages of nine and fourteen years. It is that type to which Dr Pavy has given the name of "**cyclic,**" and which has been described by various writers under the terms "**postural**" and "**orthostatic.**" The characteristics of this form of albuminuria are that the urine passed in the morning, before or immediately after rising, contains no albumen; that after the patient has been up and going about for some time the next specimen passed contains a definite amount of albumen; and that the albumen diminishes as the day goes on, and is absent or present only as a slight trace when he retires to rest. Nucleo-albumen is also found, appearing and disappearing with the serum-albumen. Evidences of organic renal dis-

ease in the shape of tube casts, arterial or cardiac changes, dropsy, &c., are not found. Opinion is still divided as to the prognostic importance of this condition, and it is not a subject on which one is justified in being dogmatic. At the same time, from the point of view of treatment, it is necessary to have a definite opinion. Are the subjects of this condition to be treated as the victims of early nephritis and made into chronic invalids? Such has frequently been done in the past. As regards my own experience, I have watched over a hundred cases of this nature for several years, and so far not one has manifested any signs of organic renal disease. The treatment has been directed to maintaining the general health at the highest possible level, to avoiding molly-coddling and a low diet, and to strengthening more especially the nervous system which seems specially at fault. The renal condition has been left severely alone. Out of so many cases, if nephritis were impending, one would have expected some definite signs to have developed under a treatment not suitable for renal disease, but such has not been the case. The other symptoms associated with this form of albuminuria, and the treatment, have been considered in connexion with neurasthenia (*q.v.*). There are probably other forms of "functional" or "intermittent" albuminuria in children besides that just described, but they are usually of a passing character.

Haematuria may be associated with nephritis, or a renal tumour, or a calculus. In any case of haematuria with albuminuria, one should examine for evidences of recent scarlet fever, in the shape of peeling, sore throat, swelling of the neck, &c. Many cases of scarlet fever are so mild that no medical advice is sought during the early stage, and the first symptom to attract attention may be haematuria. During what may be called the rhubarb season, one usually meets with some cases of haematuria from this vegetable. Rhubarb contains a large amount of oxalic acid which is excreted as oxalate of lime crystals. These crystals irritate the delicate structures of the kidneys so much as to cause bleeding, often to a very marked degree. The condition soon passes off if the consumption of rhubarb is stopped, and the system is well flushed out with plain water. In infants, haematuria may be the earliest sign of scurvy, and it is advisable to bear this in mind before diagnosing a calculus or malignant growth. Haematuria may also be associated even in very young children with the passage of uric acid crystals, which will usually be seen in considerable amount in the urine.

Haemoglobinuria is not a common condition, and as a rule is not amenable to direct treatment. In paroxysmal cases, as a chill of some sort is the usual precursor of an attack, care must be taken to avoid this risk. The underlying disease in some

cases would appear to be hereditary syphilis, but the connexion between the two is not understood. Anti-syphilitic treatment should be employed when attacks of haemoglobinuria occur in a child presenting signs of syphilis.

Incontinence of Urine.—Incontinence of urine may be nocturnal, or diurnal, or both. The first is the most frequently met with, and is common in both sexes. Rectal incontinence is sometimes an associated affection. The most intractable cases are those persisting from infancy, those arising during childhood being much less so. The condition calls for a thorough and systematic examination in every case in order to ascertain the cause or causes at work, as there is no routine treatment for all cases. This examination will comprise (1) the urine, (2) the urinary passages, (3) the spine, (4) the dietetic and other habits, (5) the mental and nervous condition.

(1) **The Urine.**—An irritating state of the urine may be caused by excessive acidity, or excess of phosphates, or pyuria, or bacteriuria. Excessive acidity may be due to overloading with uric acid or oxalates, combined with a scanty amount of urine, although the frequency with which it is passed may suggest that there is polyuria. An extremely irritable condition of the bladder is produced, which leads to frequency of micturition by day and some-

times incontinence at night. This is sometimes the result of a domestic method of treatment, namely giving the child very little fluid in the belief that too much urine is being passed. The more concentrated the urine, the more irritating it tends to become. Consequently in such cases one should see that a full amount of plain water or barley water is given, preferably between meals, and during the day. It is not advisable to give any fluid for two hours before the child goes to bed, as a full bladder during sleep will almost certainly provoke micturition. Phosphaturia, with a strongly alkaline or ammoniacal urine, points to cystitis. Pyuria may be due to pyelitis or cystitis. Bacteriuria is sometimes found, of uncertain origin. This is to be treated by means of urotropin, five grains well diluted with water three or four times a day. Sometimes polyuria may be present and the constant distension of the bladder with fluid may lead to incontinence, as occurs in connexion with some cases of diabetes insipidus. This condition calls for a diminution in the amount of fluid taken. Spanton has made the interesting observation in female children that frequency of micturition may be caused by the presence of wool fibres in the urinary passages, these fibres coming from the "combination" garment and passing up the urethra. Speedy relief followed the disuse of the garment and the employment of Contrexville water.

(2) **The Urinary Passages.**—Great stress has been laid on phimosis, or a long prepuce, as a cause of incontinence of urine, and few children with these conditions escape circumcision as a remedial measure. It is seldom of any benefit. If the condition of the foreskin is such as to call for circumcision on other grounds than incontinence then it should be done, but this operation should not be relied on as a cure for enuresis. A condition of cystitis if present must be treated, and the child should be sounded for stone if there is any suspicion of that complication. When cystitis and an ammoniacal urine are present the bladder should be washed out twice daily with boracic acid lotion (10 grains to the ounce), and a medicine containing salol (grs. v), urotropin (grs. ii), and tincture of hyoscyamus (℥. x) should be given twice daily. It is important to note whether the bladder is thoroughly emptied after micturition, for some cases would seem to depend on spasm or incomplete relaxation of the sphincter. This muscle only relaxes when a certain amount of urine is in the bladder, and contracts again when a certain amount has been passed, with the result that a more or less constant dribbling of urine takes place. In such cases the bladder can usually be felt on abdominal examination to be distended after micturition. In the treatment of this form it may be necessary to pass a catheter twice a day so as to ensure complete emptying of the bladder. Nux vomica and bella-

donna will also be found serviceable. If the patient is found to be suffering from pyelitis, one may order salicylate and benzoate of soda (five grains of each thrice daily), or urotropin (five grains, well diluted with water, thrice daily).

(3) **The Spine** should always be examined for spina bifida or caries. In some rare cases the only trace of a healed spina bifida may be vesical incontinence (with possibly rectal incontinence) due to the involvement of the sphincter branch of the long pudic nerve. There is no cure for such a condition. In other cases there may be spinal caries, which is amenable to treatment. Incontinence may also be due to organic disease of the cord or brain.

(4) **Dietetic and other Habits.**—In many cases of enuresis it will be found that the child has been systematically overfed or improperly fed. It is not so much the material that is at fault as the quantity. Nevertheless an excess of strong meats or meat soups will do more harm to the unstable nervous system than an excess of fatty or farinaceous or sugary diet. In all cases a simple mixed diet should be ordered, and the quantity should be limited at each meal so as to ensure complete digestion and no overloading of the blood and tissues. The subject of fluids has been already referred to. All stimulating diuretics such as tea, coffee, beer, and spirits must be strictly forbidden. Also spicy

foods, sweets, and salted articles of diet are contra-indicated. An effort should be made to secure as sound sleep as possible. During the night micturition usually occurs at the beginning or towards the end of the sleeping period, when the senses are not absolutely dulled. The child's bladder should therefore be emptied immediately before retiring to rest. He should have a light evening meal, preferably half a pint of boiled bread and milk, so as to have the stomach completely empty before going to bed. This meal should be taken at least two hours before bedtime. The bedroom should be cool and airy, and the bedclothes should be light and warm. If there is any tendency to cold feet, night socks or a hot bottle should be used. Too great warmth in bed is to be avoided. The child should be taught to sleep on his side, at full length, and not curled up. Any source of irritation which tends to produce broken sleep should be removed if possible. Amongst such must be classed obstruction from adenoid growths in the naso-pharynx, and large tonsils. The procuring of normal respiration by the removal of nasal obstruction will often do much good in cases of enuresis. Another source of nocturnal disturbance is the irritation caused by thread-worms, and this must be relieved if necessary. A useful measure in the early stages of the treatment is to take the patient out of bed an hour after retiring, for the purpose of emptying his bladder, but this is only to be a temporary proceeding.

During the day the child should be encouraged to empty his bladder at regular times, and not too frequently. At the same time much unnecessary cruelty is often practised at school by preventing the child responding to the frequent calls of nature. This must not be allowed.

(5) It must be conceded that all the preceding factors are but occasional and accidental in the production of enuresis. In other words many children will be found to have one or more of these conditions present, but not to have incontinence of urine. In the background of all cases there will probably be found to be some **defect or disorder of the nervous system**, cerebral, or spinal, or both. As regards the cerebral condition, there may be epilepsy or backward development, or hyperexcitability. Incontinence may be the only sign of a mild form of nocturnal epilepsy, but this is probably rare. If confirmatory evidence of epilepsy is present, suitable treatment must be adopted. On the other hand it will frequently be found that signs of backward or delayed intelligence are present in the subjects of incontinence. The condition may be a temporary and slight one, or it may be marked and progressive. In the latter class the prospect of recovery is not good. In the slighter cases the physician will have to depend for the diagnosis on his own examination, for the condition is one which parents will seldom recognize or admit. These are not to be regarded as hope-

less cases by any means, for delayed development does not necessarily mean defective development later on. One must hesitate, however, about the prognosis, for unless the cerebral development does advance, treatment of the incontinence is apt to be unsatisfactory. Another type met with is the quick, bright, nervous child whose cerebral functions seem to be over-developed and over-active. In such cases it is probably the inhibitory centres which are not correspondingly developed, so that slight stimuli produce too active responses. Sometimes, with or without definite cerebral disturbance, the lumbar centre for micturition seems to be in a particularly unstable condition, and to act too promptly on any vesical stimulus. The nervous theory seems to get strong confirmation from an everyday hospital experience that admission into a ward leads promptly to the disappearance of incontinence. One constantly meets with cases in which there is a history of nightly incontinence, which does not yield to any treatment in the out-patient department, but does not occur in the hospital. It is difficult here to conceive of any factor save the mental one, the child being stimulated in its new surroundings to exert an amount of control which was not called out at home.

It is of the first importance in the treatment to see that the child's nervous system is developed as steadily as possible, without excitement, without over-stimulation, and without over-restraint. As

a rule school-life is injurious. It is advisable to arrange for three or six months of home life, provided that superintendence can be carried out at home. In some cases the lack of supervision at home will be worse for the patient than the ordinary life at school. Sometimes if the child is sent away to friends, the mental effect may be such as to lead to greater control over the faulty centres. Encouragement may be offered by suitable rewards, but punishment should never enter into the treatment of enuresis. The digestive system must be regulated, and it will be found useful to give a bi-weekly dose of calomel. If the child's general health is bad, there is no better tonic than cod liver oil with hypophosphites. Anaemia and other signs of debility must be treated.

The drug which has deservedly secured the first place in the treatment of this affection is belladonna. Some prefer to use the tincture, in which case one begins with ten-minim doses thrice daily, and gradually increases the dose until a drachm or more is taken daily. In all cases the drug should be pushed until some definite physiological effect is produced such as dryness of the throat, dilatation of the pupils, or erythema. More exact dosage and, as many believe, better results are obtained by using atropine. One should begin with half-minim doses of the liquor atropinae thrice daily for a child of five years, and increase this in a week to one minim. The drug must be steadily pushed, but if there has not

been any improvement when six minims daily are being taken, it does not seem advisable to increase the dose. If improvement has begun then one is justified in still further pushing the drug. If symptoms of poisoning appear, such as delirium, difficulty in swallowing, &c., the atropine should be stopped for some days until the patient has recovered, and then resumed, the dose being half of that which had led to these symptoms. If under the atropine treatment the incontinence has been checked entirely, the drug may be continued in the same dose for a fortnight, and then reduced by a half. It is rather difficult to fix any definite period for the administration, but if the incontinence has ceased entirely for a month, there is no need for further continuous treatment. For the next two months the same dose may be given every alternate week. If at the end of that time there has been no recurrence one may reasonably hope that the case is cured. Relapses are very common, and are largely due to the faulty habits at home to which the patient has been allowed to return. These relapses must be treated on exactly the same lines as the original trouble. No other drug has stood the test of experience like belladonna, but some others are occasionally found to be beneficial. Amongst these may be mentioned the liquid extract of ergot (half-drachm doses), the fluid extract of rhus aromatica (ten-minim doses), and antipyrin (five-grain doses).

We may sum up the treatment of incontinence as follows :—

(1) Remove any source of irritation in the urine or the urinary passages.

(2) Regulate the diet, secure sound sleep, and build up the nervous system.

(3) Give atropine in full doses.

Nephritis is not a common affection of childhood, and the vast majority of the cases met with are secondary to some infectious fever. Amongst these scarlet fever takes the first place. It is a safe rule in all cases of acute nephritis to think of scarlet fever, and to examine carefully for a history of sore throat, glandular swelling in the neck, or a rash, and for signs of desquamation, sore throat, aural discharge, &c. The disease may be acute or subacute or chronic, and the symptoms in the various forms are the same as in adult life. One point to be remembered in connection with the acute form is that the prognosis as to ultimate recovery is better than in later years, and that therefore no pains should be spared to make the treatment thorough, and if necessary, prolonged. As regards the treatment of the various forms of Bright's disease in childhood, it does not differ in any respect from that employed in adult life. Rest in bed, warmth of the body, a diet of milk, farinaceous foods, and vegetables, attention to the action of the bowels and skin, and the treatment of any compli-

cations sum up the general management of an acute case. In chronic cases one should remember the possibility of syphilis being the cause, and employ mercury if there should be confirmatory evidence. Dr. Leonard Guthrie has recorded cases of interstitial nephritis in childhood, in which he believes that hereditary syphilis was the initial cause.

Pyelitis in infants is a peculiar affection to which attention has been drawn by Holt, Thomson, and others. It is characterized by high and irregular fever, by rigors, and by pyuria. The occurrence of rigors is an almost pathognomonic symptom. The infection would appear in most cases to be derived from the intestine, the bacillus coli being found in the urine. Holt believes that the colon bacilli travel up the urethra, in female infants especially, from the stools, producing first cystitis and later pyelitis. The treatment consists in the free administration of alkalies. An infant of twelve months should be ordered citrate and bicarbonate of potash, five grains of each three times a day. If necessary the dose may be increased, the object being to make the urine definitely alkaline, when improvement usually sets in. If the urine is alkaline throughout, benzoate of soda may be tried in four-grain doses. Holt lays stress on the value of urotropin in this affection, the dose being one to two grains every three hours for an infant of twelve months. John Thomson

has pointed out that scurvy is sometimes a cause of pyelitis in infancy, in which case anti-scorbutic treatment must be employed.

Vulvo-vaginitis in its most common form is due to a want of cleanliness. This will usually be speedily relieved by frequent bathing of the external genitals with a lotion of sanitas (one drachm to half a pint) or boracic acid lotion. The parts should then be carefully dried and dressed with white precipitate ointment (one part) and vaseline (three parts). A more serious form of the affection is that associated with **gonorrheal infection.** This may be acquired in a perfectly innocent way from some article which has been in common use in an infected family. It is a disease very difficult to cure, and very apt to spread amongst female children if the strictest precautions are not taken. In the case of an institution where female children are living together the possibility of this form of vulvo-vaginitis must be kept in mind, the nurses in charge should be instructed to report any case of a vulvar discharge, and if a gonorrheal case is detected the patient should be at once isolated or sent home. At Paddington Green Children's Hospital no patient suffering from a vulvar discharge is admitted, as the risk to the other patients is considered to be so great in the case of gonorrhea. A patient with gonorrheal vulvitis should as far as possible be kept in quarantine, and all the articles

used by her, such as soap, towels, clothes, bed linen, &c., must not be touched by other children The nurse in charge must take all precautions as in infectious disease. Diapers should be worn so as to prevent the child carrying infection to its eyes. Holt advises irrigation of the parts with protargol (1 to 10 per cent. solution), or argyrol (5 to 25 per cent. solution). In addition to irrigation the parts may be packed with gauze soaked in these lotions. Frequent applications are necessary. The disease tends to run a prolonged course in spite of careful treatment, and complications may arise such as peritonitis, arthritis, and conjunctivitis.

CHAPTER IX

GENERAL DISEASES

TUBERCULOSIS—SYPHILIS—RHEUMATISM.

Tuberculosis.— Tuberculosis in childhood presents certain differences from the same disease in adult life. The striking feature is the tendency for a localized form of tuberculous disease to infect the whole system, producing a widespread miliary tuberculosis or the equally fatal tuberculous meningitis. Very often before the onset of the acute disease the presence of local trouble has been unsuspected, being situated in some internal lymph gland, and having produced no symptoms. This suggests the chief **preventive line of treatment** in tuberculosis, namely to remove any peripheral irritation which may lead to glandular enlargement. The three glandular areas of special importance are the cervical region, the thorax, and the abdomen. In children who are at all predisposed to tuberculosis, it is necessary to protect these regions. The sources of irritation and absorption for the cervical glands are the teeth, the

tonsils, the adenoid tissue in the naso-pharynx, the scalp, and the ear. All these tissues must therefore be kept healthy, and on the appearance of any glandular enlargement must be carefully examined and treated if necessary. The larynx, trachea, bronchi, and pulmonary tissues are the sites of entrance of tubercle bacilli to the glands at the root of the lungs and around the trachea. Neglected colds, chronic bronchitis, and pneumonia may allow of the penetration of bacilli which pass to the glands and develop there. They may continue to grow long after the pulmonary or bronchial trouble has passed off entirely. Hence comes the importance of treating respiratory disorders thoroughly so as to maintain the respiratory passages in a healthy condition, and thus prevent the entrance of tubercle bacilli. Similarly the development of tuberculous mesenteric glands is to be traced to a weakened condition of the mucous membrane of the bowel from catarrh, &c. If it were possible to maintain the alimentary canal and the respiratory passages in a healthy condition we should have made great strides in the prevention of tuberculosis in early life, even amongst that class of the population where the surroundings as regards light and fresh air are far from satisfactory. Within recent years the preventive measures, in the case of infants, have largely centred round the attempt to provide them with tubercle-free milk, the belief being that the chief danger of tuberculous disease

was through the food and the bowel. The results of post-mortem experience, which is the only reliable test, show that the thoracic glands are much more often primarily affected, and are more extensively diseased than the mesenteric. This points to the chief danger in early life being in the air and not in the food. It emphasizes the fact that if an infant is supplied with cool, fresh, pure air, night and day, he will be less likely to develop tuberculosis than if he is kept in a stuffy hot atmosphere which induces colds, and allows of the entrance of the tubercle bacillus. The chief indications in the preventive treatment of tuberculosis in early life are to furnish the child, as far as possible, with tubercle-free air and food, and to maintain a healthy condition of the respiratory passages and of the alimentary canal.

The **general treatment** of tuberculosis in childhood is to be carried out on the same lines as in adult life. The open-air treatment, either at home, or at the seaside, or in a sanatorium, is of great value. The child should be supplied with plenty of nutritious food, but should not be overfed. The fatty foods, such as milk, cream, butter, yolk of egg, and cod liver oil are of great service, and the proteids such as beef, mutton, fowl, and fish, should also be given freely. The carbohydrates, such as bread, potatoes, and puddings, are to be given in moderation, as their therapeutic value in this affection is not comparable to that of the other two. The

dietetic regimen must be carefully regulated according to the state of the digestion, and the indications will be found described in connexion with tuberculous peritonitis. During the acute stage of tuberculosis rest in bed is always advisable, but even although pyrexia is present it is not necessary to restrict the diet to sloppy food. If the digestion is good a full diet may be taken with benefit. With an evening rise in temperature lassitude and disinclination for food may arise, and the patient should not be forced to eat at this time. During the apyrexial period of the day it will often be found possible to administer large quantities of nourishing food, and this must be taken advantage of. The only specific treatment of tuberculous disease at present under consideration by the profession is that of Wright, and the results of tuberculin injections under indications supplied by the opsonic index are not yet completely known.

Regarding the generalized forms of tuberculosis —miliary tuberculosis and tuberculous meningitis —little can be done in the way of treatment. One can only render the patient as comfortable as possible by good nursing, by the use of bromides and opium, and by refraining from meddlesome interference.

Tuberculous Glands.—An early condition of tuberculous glands is to be treated first of all by the removal of any source of irritation in the regions

connected with the glands. Whenever possible the child should be sent to the seaside, the east coast and Margate especially possessing a good reputation in such cases. Local treatment by means of iodine is of little use in the case of cervical glands and may do harm. Small doses of iodide of potash (grs. i–iss) and of arsenic (Fowler's solution, ℥ i–iss) may be given for a month at a time. Iron has been poured in from time immemorial, but it is so apt to upset the digestion, in the common mixture of syrup of the phosphates and syrup of the iodide, that more digestible preparations are advisable. If there is definite anaemia then iron may be administered in a preparation like the following :—

℞. Ferr. et Am. Citr., grs. ij ; Potass. Citrat., grs. ij ; Glycer., ℥ x ; Aq. Dest. ad ʒ j.—T.D.S.

Or—

℞. Ferri Sulphat., gr. ½ ; Sodii Sulphat., grs. x ; Ac. Sulphur. Dil., ℥ ½ ; Glycerini ℥ x ; Aquam ad ʒ j.—T.D.S.

The medicinal ingredients of the compound syrups of iron and the hypophosphites can be prescribed in tablet form, and will cause less gastric disturbance than in the syrupy preparations. The persistent use of cod liver oil with hypophosphites will often lead to the disappearance of tuberculous glands.

If breaking down and abscess formation occur in a tuberculous gland in the neck, or if the enlarged glands fail to yield to medical and hygienic treatment, then surgical interference is called for. The whole of the diseased glands should be thoroughly removed, to prevent as far as possible extension of the disease, and also the ugly scarring of the neck which will follow from the bursting of local abscesses.

Pulmonary Tuberculosis does not occur with the same frequency in childhood as in adult life. The disease may present itself in various forms, and the treatment is the same as that employed in later years. Tuberculous pleurisy occurs frequently as an apparently primary disease, or it may be associated with tuberculous peritonitis. It is advisable to recognize that an attack of tuberculous pleurisy, setting in acutely, will usually run a definite course, in the absence of complications, and that this course will not be shortened by any active treatment. Effusion usually takes place, and if the fluid is withdrawn early it often reaccumulates. Consequently it is better to wait until the pyrexial stage has subsided before withdrawing the fluid, unless urgent symptoms are caused by the quantity of fluid. In many cases, under rest in bed, the cessation of pyrexia will be followed by reabsorption of the fluid. If active pulmonary tuberculosis is present on the same side the question arises whether the fluid should be withdrawn or

not. Opinions differ on this subject, but my own experience has been that delay does not seem to do any harm, and that the enforced rest to the lung from the presence of the fluid has sometimes seemed to benefit the pulmonary tuberculosis.

Abdominal Tuberculosis will be found discussed in another chapter (p. 105).

Syphilis.—Syphilis is a disease which presents itself under various aspects in infancy and childhood. The acquired form is comparatively rarely met with and is manifested in the same way as in adult life. The congenital type of disease is quite common, and under certain of its clinical aspects may be easily overlooked. If the mother is suffering from active syphilis it is extremely important that she should be treated during the whole period of pregnancy, so that the fœtus may also get the benefit of the mercurial course. When syphilis is recognized in an infant, all precautions must be taken to prevent the extension of the disease to relatives and attendants who may come in direct contact with the infant. At the same time it is not common to find examples of direct contagion, and the liability to this mode of extension of the disease has probably been exaggerated. The mother should suckle her infant whenever possible, as the nutrition of these babies is most easily maintained on breast milk. Owing to the risk of contracting

syphilis through inoculation by the nipple a hired wet nurse must not be employed.

Medical advice will usually be sought some time during the first month of life for a skin eruption, or snuffles, or wasting. In many cases the early symptoms are described as "thrush," which may be in the mouth, or about the buttocks, and is popularly regarded as of no importance, being incidental to infancy. This fact should lead the practitioner in every case to make a thorough examination of the infant, if syphilis is even suspected. The skin generally, the mouth and nostrils, the anal region, the palms, and the soles should be carefully inspected.

Constitutional treatment must in all cases be adopted, and mercury is the important drug. No more striking therapeutical results are obtained than those from mercury in congenital syphilis. In many cases the improvement secured, even in apparently hopeless conditions, is little short of marvellous. The important things to remember are that it must be given in sufficiently large doses, must be persevered with for a long time, and must be combined with special attention to the general health. Many of these patients, if so treated, will at the end of twelve months be thoroughly well grown and in the best of health. Cases of idiosyncrasy in which the drug is not well tolerated are very rare. It may happen, as Guthrie has suggested,

that in the presence of syphilitic nephritis elimination is defective, and symptoms of poisoning may arise. In such cases one must use only minute doses of mercury. In a well marked case, however delicate or young the infant may be, it is well to commence with one grain of mercury with chalk three times a day, as in the following powder.

℞. Pulv. Hydrarg. c. Cretâ, gr. j; Sodii Bicarb., grs. iv.

The soda is given with a view to checking any irritating effect in the alimentary canal, but it is doubtful whether this is a real danger in infants. Far from inducing diarrhoea, the mercury seems at times to produce constipation, if the maternal statements on the subject are to be credited. In slighter cases, and when the nutrition of the child shows an absence of constitutional effects, half a grain of grey powder may be given thrice daily. Mercury is a drug which is so well tolerated as a rule by infants and children that symptoms of overdosage are rare. If they appear, and the first sign is usually diarrhoea, it is better to reduce the dose than to try to check the diarrhoea by means of opium. Merely to check the diarrhoea will not prevent the development of mercurial overdosage. The advantage of giving mercury by the mouth instead of by inunction is that in the former the exact amount entering the system is known, in the latter it is not. A further advantage lies in the local effect which mercury has on the

alimentary canal, in stimulating the secretions, and frequently in removing some of the results of improper feeding. Mercurial inunction is preferred by certain practitioners, and as a rule its action is quite satisfactory. Blue ointment and lanolin, half a drachm of each, may be rubbed into the abdomen every morning after the bath, and covered with the flannel binder. This remains on until the following morning, when after the bath a fresh supply is applied as before. It is very important that the ointment should be thoroughly rubbed into the skin so as to procure as much absorption as possible. If there are signs of irritation, which may occur in infants with delicate skins, or those suffering from a rash (sudamina, eczema, &c.), the site of inunction may be changed at times to the axillae, or the back, or the thighs. In some severe cases, where quick results are desired, it will be found useful to employ both methods of treatment, by the mouth and by inunction. Various other means of administering mercury are in use, e.g. by calomel (gr. $\frac{1}{6}$–$\frac{1}{4}$ T.D.S.) or liquor hydrargyri perchloridi (℥. x–xx T.D.S.), or calomel fumigation, but they possess no advantage over those already described. The duration of the mercurial treatment will vary with the condition of the patient, both locally and generally, but in many cases it is stopped too soon owing to the fact that when the active signs disappear the patient disappears also. It is always well to tell the parent at the commencement that a prolonged course of treat-

ment will be necessary, even although the health seems quite satisfactory. If the patient can be kept under observation and treatment, the initial dosage may with advantage be kept up for three months continuously. If symptoms of mercurial irritation appear during that time the dose may be reduced one half. After three months of treatment smaller doses are required and less continuous administration. One half the initial dose may be given for a week and then intermitted for a week, and this ought to be continued for nine months. If active signs of the disease reappear during this period, the full dose should be resumed and given continuously for a time. At the end of twelve months of treatment, and in the absence of any active signs of the disease during the last six months, the patient may be regarded as cured, so far as that term can be applied to syphilis. It simply means that in all probability there will be no further symptoms of the disease, but one cannot guarantee their non-appearance.

Syphilitic infants require also very careful dietetic and hygienic treatment. Some of them are well nourished and appear to be in good health. These are the exceptions. The majority are wasted, puny infants, with weak digestion, defective powers of assimilation, and poor nutrition. A diet of a "feeding up" kind will therefore produce disastrous results and aggravate the condition. The food should be of a simple, easily digested kind, and therefore peptonized milk, whey, albumen water and

raw meat juice will prove useful until the general health has been restored. Brandy (℥ j. to iij daily) will often give a useful fillip to the poisoned system, and tincture of nux vomica (♏ j–ij T.D.S.), or liquor strychninae (♏ j T.D.S.), will also be found useful. In children who have passed the age of infancy the general health must also be supported by dietetic and medicinal measures. In all cases plenty of fresh air and sunshine, warm clothing, rest, and sleep are requisite in the successful management of this disease.

The **syphilitic cachexia** is often well manifested and calls for special treatment. Anaemia of a marked kind may be present and is best treated by the addition of raw meat juice (℥ j to ij T.D.S.), to the diet. Iron should not be administered until the digestive organs are in a healthy condition, and it will often be found that mercury will remove the anaemia most effectively. In other cases a small dose of the saccharated carbonate of iron (grs. j–ij) may be given twice a day with the grey powder. Restlessness and sleeplessness may increase the debility of the infant. For these bromide of potassium (grs. v) may be given at night, and repeated if necessary during the day. If pain seems to be present, as manifested by restlessness and moaning, half a grain of Dover's powder may be given once or twice a day. The persistent wasting which is so often met with in this affection does not call for the

disuse of mercury, but rather for its steady use, while at the same time one tries to improve the nutrition of the patient by appropriate diet.

Certain local conditions call for special treatment. **Syphilitic rhinitis**, which is commonly known as "the snuffles," may seriously interfere with the infant's breathing and feeding, owing to the amount of nasal obstruction. A sanious and irritating discharge is often present, which leads to excoriation about the nostrils and upper lip. The nostrils should be carefully cleansed by irrigation with a warm alkaline lotion, so as to remove all crusts, blood, and mucus. A few drops of warmed black wash (lotio nigra one part, lime water three parts) should then be dropped into the nostrils and allowed to reach the naso-pharynx. The entrance to the nostrils and the skin around should be protected with white precipitate ointment (one part diluted with nine parts vaseline). This process should be carried out twice a day and oftener if the obstruction is very marked. The relief afforded by keeping the nasal passages clear will often materially help in securing benefit from the other measures adopted.

The **erythematous eruptions** do not call for local treatment, but certain **ulcerations** must be considered. The appearance of numerous clean-cut superficial ulcers at and around the anus is very characteristic. Under conditions of neglect these tend to spread over the buttocks, across the peri-

naeum, scrotum or vulva, and down the thighs, and may coalesce to form large ulcers. Great care should always be taken to protect these regions by preventing any soiled or wet diapers from remaining in contact with them. One can usually tell from the condition of the ulcers how far these precautions have been observed. After the infant has passed water or a motion the buttocks should be washed with warm water, dried thoroughly, and then dusted with a powder consisting of equal parts of starch and calomel. This will usually lead to the rapid healing of the ulcers. If fissures or condylomata are present about the anus, the powder is to be applied thoroughly to these lesions, and a small quantity of dilute white precipitate ointment may be passed inside the bowel.

A very characteristic syphilitic lesion is **epiphysitis**, which is usually first detected by the presence of pain in the affected limb when it is handled or moved. Owing to the pain, the infant does not move the limb voluntarily, and a condition of pseudo-paralysis develops. The long bones of the upper limbs are affected more frequently than those of the lower, and the condition may be bilateral or unilateral. On examination the epiphysis affected is found to be enlarged and tender, effusion tends to extend along the shaft under the periosteum, and the limb below may be oedematous from interference with the circulation. The disease does not occur after the age of six months, and the great majority

of cases are found during the first three months. Scurvy can therefore be excluded, owing to the age, and the only disease with which this condition may be confused is septic epiphysitis. The latter is accompanied by pyrexia and constitutional disturbances which are not present in syphilitic epiphysitis. The treatment, in addition to the internal administration of mercury, consists in the application of a Scott's dressing, and the fixation of the limb in a splint. An ounce of unguentum hydrargyri compositum is spread over lint and applied to the arm or leg affected. A poroplastic splint is then moulded to the limb, padded, and applied over the Scott's dressing, the arm being fixed at a right angle and the leg in an extended position. This dressing is continued for a week, the limb being kept carefully at rest, and at the end of that time the limb will probably be freely movable, and all trace of the effusion will have passed off after another week of the same treatment. The local treatment by mercury seems to have a directly beneficial effect, for I have seen epiphysitis develop while mercurial medication by the mouth was going on, and yield rapidly to mercurial inunction.

Syphilitic meningitis is an affection of intrauterine life, or it may occur after birth, usually during the first six months of life. It is a chronic affection, and the only disease with which it is likely to be confused is posterior basic meningitis. The

latter form has usually an acute onset, with vomiting, head retraction, and pyrexia, while syphilitic meningitis has usually a gradual onset with wasting and drowsiness, and it may not be suspected until the development of hydrocephalus attracts attention. The conditions to be treated are first the meningeal effusion, which tends to be at the base of the brain, and to form adhesions there which block the exit of cerebro-spinal fluid from the ventricles, and secondly hydrocephalus. Even in the absence of confirmatory signs of syphilis in other parts of the body, if meningitis occurs during the first six months of life, and is not the characteristic basilar meningitis of infants, it is advisable to give mercury in full doses and for a lengthened period. There is no other treatment which is at all likely to do good, and striking results often follow the use of mercury, even in those cases where hydrocephalus has developed. In order to secure the best results it is well to combine the treatment by the mouth and by inunction as already described. If the hydrocephalus does not yield to mercurial treatment, other measures may have to be employed (*vide* Hydrocephalus).

The chief manifestations of congenital syphilis are to be met with during the first year of life. **Recrudescences** of these **may occur later** and are to be treated on the same lines. It will seldom be found that larger doses of grey powder than three grains a day are required, but if the lesion does not yield to that dose, it may be increased gradually until six

grains a day are being taken. Usually the combination of inunction with treatment by the mouth is to be preferred to large doses of grey powder. Certain other lesions may develop after the age of two years. **Periostitis** of the long bones, accompanied by pain and localized thickenings, is one of these. In such cases, in addition to mercurial treatment one can give with benefit iodide of potassium (grs. v T.D.S.), or combine it with iodide of iron (syrupus ferri iodidi ʒ ss. T.D.S.). During the active stage it is advisable that the patient should be kept in bed. **Gummata** may form, either in the viscera (liver, &c.) or on the periosteum or pericranium, or in the subcutaneous tissues. They usually yield to the combined treatment by mercury and iodide of potassium. A characteristic affection, occurring between the ages of six and twelve years, is a **painless form of synovitis** with effusion, usually bilateral, and very often affecting the knees. The diagnosis is easily made from the nature of the swelling, but additional evidence of the syphilitic origin will often be found in some other parts of the body (notched teeth, scarring about the mouth or anus, &c). **Interstitial keratitis** develops at the same period of life and is often present along with syphilitic synovitis. While one naturally employs treatment by mercury and iodides in this arthritic condition, and while many writers report benefit from such treatment, my own experience has been that it is of little use. The effusion in cases coming under

my own care has seemed to run its own course uninfluenced by such treatment, by rest, by fixation and by massage. The method of interrupted circulation which consists in rendering the limb bloodless by elastic pressure, and then releasing it suddenly so that a thorough arterial flush takes place, has removed the fluid only for a time. A case has come under my notice in which the joints had been opened and drained for a time, without any benefit accruing. So that my own experience of syphilitic synovitis has been that this affection, like interstitial keratitis, tends to run a prolonged course, over several years it may be, with temporary improvement, with possibly a period of cessation, and then a relapse, and that no treatment, mercurial or otherwise, will have any direct effect. As some cases have, however, benefited from such treatment, as the published records show, it is advisable both in synovitis and keratitis of this nature to employ treatment by mercury and iodide of potash.

Certain other late lesions of congenital syphilis do not seem to yield to specific treatment. Amongst these may be classed **interstitial nephritis, haemoglobinuria, labyrinthine deafness,** and degenerative **lesions of the central nervous system.** All that one can claim for treatment by mercury and the iodides in such cases is that possibly the progress of the lesion is thereby delayed.

Rheumatism.—Rheumatism is a disease which is practically unknown during the first two years of life and which is very frequently met with after that age. The importance of this age incidence is that during infancy one should not treat as rheumatic a case of arthritis or tonsillitis, but should carefully exclude every other local or constitutional disease before making a diagnosis of rheumatism. In childhood rheumatism may appear as rheumatic fever, a disease similar to but not identical in its course with the form met with in adult life. In other cases the disease may be manifested by some local rheumatic lesion, which again may run either an acute or a chronic course. We shall consider the treatment of rheumatism under these various aspects.

Rheumatic fever is as a rule characterized by pyrexia, usually of moderate type, i.e. not above 102° F. or 103° F., by general malaise, by headache, by pains about the limbs, and possibly by arthritis with slight effusion. The importance of an attack is not to be measured by its acuteness, but by the extent to which the heart is involved. The patient should at once be put to bed, in a flannel nightdress, and should lie between blankets, in order to prevent any chilling of the surface. These precautions must be observed all through the illness, and in the convalescent stage care must be taken that the child does not get a chill by exposing its limbs, as children in bed are very apt to do. The diet ordered

should be light and nourishing, and should be given in as full amount as the appetite and inclination of the child will allow of. Milk and barley water, milk pudding, bread and milk, cocoa and milk, eggs, chicken and mutton soups are to be allowed, unless the condition of the alimentary tract indicates a more limited diet. As in all febrile affections in children, a dose of calomel (grs. ij), or grey powder (gr. iij), followed by a saline may be given at the outset and repeated occasionally. The tender limbs or the parts of them affected are to be wrapped in cotton wool. It will be found, however, that rest in bed is usually sufficient to relieve the pains quickly, especially when combined with the following medical treatment. Salicylate of soda should be given in full doses, as in the following prescription—

℞. Sodii Salicylatis, grs. x; Sodii Bicarb. grs. x; Tr. Aurant. ℥ x; Aquam Destill. ad ℥ ss. Sig. ℥ ss every four hours for a child of ten years, and half the amount for one of five years.

At the end of twenty-four or forty-eight hours the frequency of administration is reduced to every six hours, and when the temperature has reached normal it is further reduced to three times a day. The drug should be continued for some weeks after the temperature has reached normal, and if a recrudescence of the acute symptoms occurs, the full dose should be resumed. As a rule under this treatment

the temperature will reach normal within a few days, and the pains will vanish. The natural salt is preferred by some, but its price renders it prohibitive in many cases, nor does it seem to have any special virtues. Symptoms of poisoning by large doses of salicylates have recently been described by Dr. Langmead, and his record of cases ought certainly to induce caution in the administration. In the case of the doses recommended above, bad effects will arise only in cases of idiosyncrasy, which is present but rarely in children. In such cases salicin (grs. v) may be substituted. The combination of an alkali with the salicylate is always advisable, and it should be pushed until the urine is faintly acid or even alkaline. After the cessation of the salicylate treatment it is advisable to continue with an alkaline mixture (bicarbonate of soda or citrate of potash, in 5 or 10 grain doses T.D.S.) for some weeks.

A first attack of rheumatic fever will usually yield readily to treatment, and the continuance of precautionary measures in bed is dependent on the presence of cardiac complications. If at the end of a fortnight after the temperature has reached normal there has been no evidence of cardiac trouble, (endocarditis, pericarditis, or dilatation), and no other rheumatic symptoms persist, the patient may be allowed to sit up in bed and in another couple of days to get out of bed. A careful examination should still be made daily as to any indication of

cardiac trouble, and if at the end of a week none has appeared he may be considered well. Certain precautions as to his future life have now to be ordered which will be considered later.

From the outset of an attack of rheumatic fever one continues to examine the heart daily for evidences of **carditis.** The appearance of slight dilatation of the left ventricle, of blurring of the first sound, or of a faint systolic murmur will indicate some involvement of the heart. This is the commonest of all the complications in childhood, and the one of gravest importance. At the same time, it may be stated as a strong justification for the careful treatment of rheumatic fever by rest and salicylates that it is only in a limited number of cases thus treated from the outset that cardiac disease will be found to develop. The great majority of cases of cardiac disease met with in children have developed at some unknown time, or during some illness of a rheumatic nature which was undiagnosed. While the inefficacy of the salicylate treatment in curing rheumatic endocarditis may be admitted, its power in preventing carditis should also be recognized. Recurring now to the onset of cardiac trouble in a case of rheumatic fever, we have to decide as to the treatment. The indications for the salicylate treatment as outlined above are not altered by this complication, as the drug is directed to the general constitutional condition.

The onset of **endocarditis,** which usually affects

the mitral valve, is not accompanied by any symptoms which call for relief. Local treatment or any general treatment which will influence the valvulitis is unknown. The great measure we have to fall back on is rest—perfect rest of mind and body, so that the circulation maygo on in a steady, uninterrupted manner, and the natural healing of the valve may take place under the most favourable conditions. Therefore the duration of the rest after any attack of rheumatic fever is to be regulated in the presence of this complication by the cardiac condition. In favourable cases one will note three periods, first, that in which the cardiac murmur develops; secondly, that in which it persists unchanged; thirdly, that in which it disappears. This will in any case be at least a matter of weeks. If at the end of six weeks, for instance, the cardiac murmur has disappeared, are we to conclude that the valve is normal in structure and function? By no means; for if the patient gets out of bed and moves about, the increased cardiac action will probably reveal a murmur. The valvulitis may have gone, but the healing process has left a damaged valve. Still, one cannot keep the patient in bed indefinitely in the hope of restoring the valve to normal, and if the murmur is absent when he is at rest, he may be allowed to be up and take gentle graduated exercise. The second condition of affairs to which reference was made, that in which the murmur persists, may be the final

stage. We have here again to fix a time limit to the period of absolute rest, and if the murmur has persisted unchanged for three or four weeks, there is no reason for keeping the patient longer in bed, provided there are no indications of active cardiac disease, such as a feeble and dilated left ventricle, irregular cardiac action, &c. In the absence of such signs the prolongation of rest in bed will weaken the patient unnecessarily and will not benefit the valvular condition. But the increased action of the heart entailed first of all by the patient's sitting up, then by his being up in a chair, and finally by his walking, must be carefully regulated by the condition of the heart, and this will necessitate frequent examination.

The presence of **myocarditis** is shown by weakness of the cardiac muscle and dilatation of the left ventricle, with or without a systolic murmur. In recent myocarditis it is doubtful whether digitalis is of much value, and if given at all it should be in small doses. Nux vomica and strychnine are more useful at this stage, but the important part of the treatment, and what will suffice in most cases, is prolonged rest. The heart muscle will gradually recover its tone, the dilatation will pass off, and the state of the cardiac sounds and the pulse will show when the patient may be allowed out of bed.

Acute pericarditis is one of the lesions which

seems to be directly benefited by salicylates. In the presence of this complication, with or without effusion, full doses of salicylates may be given along with alkalies. The inflammation may be latent, and discovered only on examination, or it may be accompanied by extreme pain, dyspnoea, restlessness, and sleeplessness. In the latter case one or two leeches may be applied with benefit to the praecordium. The application of cold in the form of an icebag, as suggested by Dr. Lees, may give relief. If the pain is very severe, an injection of morphia (liquor morphinae, ℥ ij) should be given, and repeated every four hours until relief is obtained.

The above hints will serve to indicate the complexity of the conditions associated with rheumatic carditis, and how impossible it is to lay down hard and fast rules as to the duration of rest. The important points are that rest should be absolutely maintained during the whole period of active carditis, as judged by the cardiac strength and regularity, the condition of endocardial and exocardial murmurs, and the presence of dilatation, and for some time afterwards for the purpose of cardiac recuperation. Beyond that period continued rest will tend to debilitate the patient, and even predispose to further rheumatic attacks when he does get about.

The **convalescent stage** calls for some consideration. A liberal diet is to be allowed, of nutritious

and digestible foods. A fresh attack will often be induced by overfeeding, and in all rheumatic conditions special attention should be paid to the condition of the digestive organs. Constipation must be avoided. The following mixture will be found useful in maintaining a healthy condition in the stomach and bowels :—

℞. Pulv. Rhei, grs. ii ; Magnes. Carbon. grs. iii ; Syr. Zingib., ℥ viii ; Aq. Carui ad ʒ j.—T.D.S.

If the digestive organs are sound, then a mixed dietary of beef, mutton, fowl, fish, green vegetables, puddings, and eggs may be allowed. A pint of milk daily should be ordered. Some authorities regard beef and mutton as injurious in rheumatic cases, but if they are not given in too large quantities, they are beneficial. On the other hand concentrated beef tea or soup, and meat essences, when given with a view of strengthening the child, are probably injurious, as they overload the blood with extractives. A condition of anaemia usually follows an attack of rheumatic fever, whether cardiac disease is present or not. It is not advisable to commence the treatment of this condition with iron. In rheumatic subjects iron will often induce a recurrence of pains and indigestion. It is better, therefore, to trust to diet, to fresh air and sunlight, to cod liver oil with malt or hypophosphites, and to some raw meat juice for some weeks,

until the system is free from all rheumatic poison. If the anaemia still persists, iron may be given in small doses of the citrate of iron and quinine, or sulphate of iron, or the saccharated carbonate of iron. Another useful tonic at this stage is quinine, of which one to two grains may be given three times a day in an acid mixture, with strychnine.

A first attack of rheumatism, treated under favourable conditions, will usually be recovered from. There may be a slight mitral murmur persisting, but in the course of years this may also pass off entirely, as the valve grows. The great danger, however, in which such a patient is involved is the recurrence of rheumatic trouble, either in the form of a similar attack of rheumatic fever, or in the more insidious form of rheumatic manifestations such as tonsillitis, "growing pains," erythema, chorea, pericarditis, or pleurisy. Any one of these forms may not be recognized as rheumatic, and may not be treated as such, and may lead to fresh cardiac complications. It is therefore of the first importance that special measures should be taken, in connexion with any rheumatic manifestations in a rheumatic subject, to carry out thorough treatment, however trifling the symptoms may appear to be.

The **preventive treatment of recurrences** of the disease will require careful supervision of the patient throughout the whole period of childhood. After the age of fifteen the liability is not so great.

The diet will not necessarily be a restricted one, but care must be taken that the digestion is not impaired, and that the bowels do not become confined. Residence on a gravel or sandy soil, and in a dry, bracing atmosphere is advisable. Sometimes town life is unnecessarily considered bad, because if the surface drainage is good the damp in winter is not nearly so great as in many country places. Seaside air is not so good as that of an inland and upland district. The clothing next the skin should be of flannel, and this should be worn during the summer and winter. The question of school life is a serious one. As a rule, except at schools where the treatment of delicate children is specially attended to, ordinary school life is not suited to rheumatic children, owing to the risks involved. While one does not wish to molly-coddle these children, and make invalids of them, the necessary restrictions are not successfully carried out in the rough-and-tumble existence at school. Therefore, unless the school is one where special supervision can be given, it is better to keep the children at home, or to have them at a day school. In cases where the heart is damaged, while exercise in the fresh air is most necessary to maintain the general health, all muscular strain such as is involved in running competitions, football, cricket, &c., must be forbidden. There are two dangers associated with these sports, namely, the risk of chill from overheating, and the risk of

cardiac injury from overstrain. Gentle cycling, walking, golf, and croquet are the physical exercises suitable. At the same time, if four or five years have elapsed without any fresh rheumatic symptoms, and without any evidence of cardiac trouble, one may consider the possibility of allowing the child to engage in school life, sports, &c., like other children. One must not condemn every rheumatic child to a life of invalidism merely because of one attack of rheumatism, and the progress of the patient must decide the future lines of treatment.

Damp is especially liable to bring on an attack, so that exposure to rain and wet feet must be guarded against. Cold baths are apt to produce depression in such patients, and tepid or hot ones are preferable. The use of a hot or tepid bath will not expose the skin to the danger of a chill afterwards, provided that soap is not used to wash away all the natural protective secretion. If the child has a bath every day, even the greatest purist may rest satisfied with the use of soap to the body once a week, say on the time-honoured Saturday evening. A storm signal in the shape of an excess of urates or uric acid in the urine may sometimes be discovered in these patients. This probably points to defective hepatic action, and should be treated by a spare diet, plenty of water to drink, and a couple of grains of calomel at night. All the minor manifestations of rheumatism must

be regarded as serious in these patients, and careful treatment carried out.

(1) **Tonsillitis** is one of the commonest of these. Rest in bed with salicylate treatment should be employed as described above. The heart must be carefully examined daily, and the patient should not be out of bed until some days after the temperature has reached normal.

(2) **The Erythemata.** Certain of these are common in rheumatic subjects, viz., E. nodosum, E. marginatum, and E. exudativum. Another allied skin affection is peliosis rheumatica, a form of purpura. Erythema nodosum will usually persist for a week or ten days, with possibly the addition of fresh patches. As the erythemata tend to run a brief course, quite apart from any treatment, it is difficult to draw any certain inferences as to the value of drugs or other remedies. If one or other of them occurs in a rheumatic subject, then rest in bed and careful observation are called for, as cardiac complications may occur. If a condition of pyrexia is present, then the salicylate treatment may be carried out for a week or ten days. If the temperature is normal, salicylates are not called for. The pain of erythema nodosum may be such as to call for the application of glycerine and belladonna to the tender areas, and the fixation of the limbs in well padded splints.

(3) The so-called "**growing pains**" of children are in many cases real rheumatic manifestations. A careful examination of the extremities will usually reveal some slight arthritis (with or without effusion) or tenderness in the muscles or tendons. In other words, "**growing pains**" are usually due to **arthritis** or **fibrositis** or **teno-synovitis of rheumatic origin.** The temperature should be ascertained in order to test the severity of the condition. Even in apyrexial cases a course of treatment by salicylate of soda (grs. v, T.D.S.) should be begun and kept up for some weeks. In addition, one may order a grain of grey powder at night, massage to the affected limbs, and a pint of Contrexville water daily. The child must be kept under treatment, and under careful observation as to the cardiac condition, as long as any of these local symptoms continue. Although often slight, and often fleeting, they are a warning as to the presence of the rheumatic poison in the system.

(4) **Chorea.**—The rheumatic origin of chorea, and the general lines of treatment, are now agreed to by most. Differences arise as to the special treatment to be advised. An attack of chorea, however mild, should be treated from the outset with rest in bed, isolation from all but the nursing attendants, and a full diet of nourishing and digestible food. The excitable brain which is

always present in choreic subjects is not to be stirred by exciting conversation or tales, but is to be soothed by quiet talk, simple tales, and simple games. This is usually much better carried out by a trained nurse than by any member of the family circle, and the recovery will probably be much more speedy if the friends are kept entirely away from the patient. It is as well to warn the parents at the onset that under any treatment an attack usually lasts for a month or six weeks at least. If it lasts longer, the doctor will not have committed himself, and if it lasts a shorter time, he will get all the credit of the result. The diet ordered should consist of milk, milk foods, eggs, fish, and chicken. The fatty and carbohydrate foods are better in the acute stage than the stimulating proteids of beef and mutton. The food should be given in small quantities at regular intervals, and the digestion must not be overtaxed. The bowels should be regulated by a daily dose of infusion of senna pods and sulphate of soda, or of cascara, so as to produce at least one full evacuation. In violent cases the bed must be padded and the limbs must, if necessary, be covered with cotton wool, so as to prevent any abrasions from friction or injury. A careful examination must be made of the whole body for evidences of arthritis or other painful inflammation which will maintain the choreic disturbance unless treated. A quiet room, a quiet nurse (for an unsuitable nurse may aggra-

vate the choreic symptoms), quiet occupations, an absence of excitement or fright or worry or anxiety, regular meals, and complete rest in bed will in the majority of cases do more for the patient than any more active treatment.

As regards the **drug treatment**, the first point to be settled is as to whether anti-rheumatic remedies are to be employed or not. In the presence of (*a*) a previous history of rheumatic fever or rheumatic manifestations, or (*b*) of active rheumatic lesions, or (*c*) of cardiac trouble, or (4) of pyrexia, it is advisable to adopt full treatment by salicylate of soda. In some cases the improvement will be marked, in other cases it will be nil, and in the present state of our knowledge of chorea it seems impossible to predict the result beforehand, or to explain the different results. In the other class of case where the evidence of definite rheumatism is absent the salicylate treatment does not usually produce any benefit. Under the rest and isolation system, the symptoms may subside more or less steadily and recovery follow without the use of any drugs at all. This is quite a common type of case, and is one which has produced scepticism in many minds as to whether drug treatment really does any good. Certainly in many mild cases it is impossible to be sure of any direct benefit from the use of drugs. In more severe cases, the exhausting effect of the choreic movements must be checked if possible A mixture containing chloral hydrate (grs. v),

and bromide of ammonium (grs. v), given every four hours will be found a useful sedative. This may be pushed until the movements are quieted or until the patient becomes drowsy, when the medicine may be stopped for a day or two, and resumed if necessary for a second period. If the movements are so violent that the patient cannot be fed, it may be necessary to administer chloroform and feed by the stomach tube, until the chloral has checked the violent movements. Another sedative which is sometimes useful is brandy or whisky, and to secure an effect full doses must be given, four or five ounces daily for a child of five years. This is not to be continued through the whole course of the illness, but for three or four days at a time. A combination of the bromide-chloral with the brandy treatment, the two being carried on simultaneously, will sometimes be found efficacious in a severe attack. Another sedative measure which sometimes proves useful is hot sponging followed by gentle massage of the trunk and extremities.

Many other methods of treatment have been recommended in this affection. Dr. Lees recommends very large doses of salicylate of soda. Arsenic is by many regarded as a specific. In small doses it has never seemed to me to have any appreciable effect. In larger doses, when the amount has been gradually increased to fifteen minims of Fowler's solution three times a day, my own experience has been that vomiting and diarrhoea have led to a cessation of

the treatment before any good had followed. A very grave risk attending these large doses of arsenic is that of peripheral neuritis, a disease which is much more serious and lasts much longer than chorea. For these reasons the arsenical treatment, if it is employed, should only be used according to the ordinary medicinal dosage. It is, however, open to grave doubt whether in any toxic condition of the nervous system, arsenic, which is another nerve poison, should be administered. Dr. Eustace Smith has found benefit from the liquid extract of ergot, (in doses of ʒ ss. to i. thrice daily), combined with nux vomica. In some cases of chronic chorea I have seen improvement follow from this treatment, but the question of *post hoc* or *propter hoc* must necessarily arise.

In certain cases of chorea the symptoms are not active, but passive (chorea mollis v. paralytica). The choreic jerkings may be accompanied by great muscular weakness (paresis), or the jerkings may be absent and the patient's only manifestations may be inability to use the muscles (paralysis). The voice may be lost, the power of standing or sitting up may disappear, and all the muscles of the trunk and extremities may appear to be paralysed. In such cases more stimulating treatment is called for, such as strong massage twice a day for half an hour at a time and liquor strychninae either by the mouth (℥. ii to iii, T.D.S.), or hypodermically (℥. j bis die). The tonic treatment

should not take the form of cold baths or blisters or electricity, which are not conducive to strengthening the nervous system in the case of a highly strung child.

Relapses are not uncommon in this affection, and each fresh attack necessitates a repetition of the same careful treatment. Some cases of chorea tend to become chronic, that is to say, the acute manifestations subside, but a certain amount of mental instability and muscular twitching persists. This result would appear to follow more commonly in those cases in which treatment was not early begun or was not sufficiently prolonged. In such chronic cases the patient should, if possible, be sent away from home to a quiet country place in charge of an old nurse or sensible relative, and allowed to live an open-air life, without excitement, and with a full nourishing diet of eggs, milk, and cream. It is especially in chronic cases that one must seek for any source of peripheral irritation such as eyestrain, adenoid growths, worms, &c., and remove it if possible.

After an attack of chorea the mode of life of the child must be carefully regulated. There should be at least six months' absence from school, although home lessons may be allowed under a teacher who will not allow the instruction to be a burden or worry to the child. The whole system, and more especially the nervous centres, require time for recuperation and building up.

Hence good food, codliver oil and hypophosphites, fresh air, and exercise are of the first importance. If rheumatism has been present, the special precautions already given in connexion with rheumatic subjects must be attended to. The excitements which are so freely provided for children in the present day, such as parties, shows, theatres, &c., must be strictly forbidden. In any case it will take years before the tendency to cortical irritation engendered by one attack of chorea will subside. If the child does return to school eventually the effect must be noted, and under no circumstances should the strain of competition be allowed a choreic child. Even after childhood, the question of how far ordinary school life is advisable can only be settled by the length of time during which there has been a complete absence of symptoms.

CHAPTER X

PHARMACOPOEIA FOR CHILDREN

THE following prescriptions are selected from the pharmacopoeia of the Paddington Green Children's Hospital, by kind permission of the Committee. The dose in each case is one suitable for a child of two years.

MISTURA FEBRIFUGA.

℞.	Liq. Ammon. Acetat.	℥ xv
	Spir. Aether. Nitrosi	℥ v
	Syr. Aurantii	℥ v
	Aq. Destill.	ad ʒ j

MISTURA ALBA.

℞.	Magnes. Sulphat..	grs. x
	Magnes. Carbon.	grs. ii ss
	Syrupi	℥ v
	Aq. Menth. Pip.	℥ xxx
	Aq. Destill.	ad ʒ j

MISTURA AMMONII ACETATIS.

℞.	Liq. Ammon. Acet.	℥ xv
	Potass Citrat.	grs. ii ss
	Syrupi	℥ v
	Spir. Chlorof.	℥ i
	Aq. Camphor..	ad ʒ i

Mistura Belladonnae et Bromidi.

℞. Tinct. Belladon. . . . . ♏ ii
Potass. Bromidi . . . . . grs. ii
Ammon. Carbon. . . . . gr. ½
Syr. Tolutani . . . . . ♏ xv
Aq. Destill. . . . . ad ℥ j

Mistura Carminativa.

℞. Sodii Bicarb. . . . . grs. ii
Sp. Ammon. Arom. . . . . ♏ ii
Sp. Chlorof. . . . . ♏ i
Aq. Carui . . . . . ad ℥ j

Mistura Cascarae Composita.

℞. Extr. Cascar. Liq. . . . . ♏ v
Extr. Glycyrrhiz. . . . . ♏ v
Tr. Nuc. Vom. . . . . ♏ i ss
Tr. Belladon. . . . . ♏ ii
Aq. Destill. . . . . ad ℥ j

Mistura Diuretica.

℞. Potass. Acetat. . . . . grs. v
Sp. Aetheris Nitrosi . . . . . ♏ v
Decoct. Scoparii . . . . ad ℥ j

Mistura Ferri Acida.

℞. Liq. Ferri Perchlor. . . . . ♏ iv
Ac. Hydrochlor. dil. . . . . ♏ ii
Glycerini . . . . . ♏ x
Inf. Calumb. . . . . ad ℥ j

Mistura Ferri Alkalina.

℞. Ferri et Ammon. Citr. . . . . grs. ii
Ammon. Carb. . . . . gr. ½
Sod. Bicarb. . . . . grs. iii
Glycerini . . . . . ♏ x
Aq. Destill. . . . . ad ℥ j

Mistura Ferri Aperiens.

℞. Ferri Sulph. . . . . gr. ½
Magnes. Sulphat. . . . . grs. x
Ac. Sulph. dil. . . . . ♏ ½
Aq. Menth. Pip. . . . . ad ℥ j

Mistura Gentianae Acida.

℞. Ac. Nitrohydroch. dil. . . . ♏ iv
Glycerini . . . . . ♏ v
Inf. Gent. Co. . . . . ad ℥ j

Mistura Gentianae Alkalina.

℞. Potass. Bicarb. . . . . grs. iii
Inf. Gent. Co. . . . . ♏ xxv
Aq. Chlorof. . . . . ad ℥ j

Mistura Olei Ricini.

℞. Olei Ricini . . . . . ♏ x
Tinct. Rhei . . . . . ♏ v
Glycerini . . . . . ♏ v
Tragacanth. . . . . gr. ½
Aq. Menth. Pip. . . . . ad ℥ j

Emulsio Hypophosphitum.

℞. Sodii Hypophosph.
Calcii Hypophosph. . . . . āā gr. ½
Ol. Morrhuae . . . . ♏ xxx
Ol. Cassiae . . . . . ♏ 1/10
Glycerini . . . . . ♏ vi
Tragacanthae . . . . . q.s.
Aq. Destill. . . . . ad ℥ j

Mistura Senegae.

℞. Ammon. Carb. . . . . gr. ¾
Aceti Scillae . . . . . ♏ iii
Syrupi . . . . . ♏ vii
Inf. Senegae . . . . . ad ℥ j

PULVIS HYDRARGYRI ET OPII.

℞. Hydrarg. c. Creta
Pulv. Ipecac. Co.
Pulv. Cret. Arom. . . . . āā gr. ½

PULVIS HYDRARGYRI ET RHEI.

℞. Pulv. Rhei . . . . . grs. iii
Hydr. c. Creta
Magnes. Carbon . . . . āā grs. i ss

PULVIS SANTONINI.

℞. Santonini . . . . . grs. i ss
Calomel.
Pulv. Amyli . . . . . āā gr. ½

LINIMENTUM TEREBINTHINAE ACETICUM.

℞. Ac. Acet. Glac. . . . . part. 1
Olei Terebinth. . . . . part. 4
Olei Lini . . . . . part. 2
Olei Dulcis . . . . . part. 2

LOTIO CALAMINAE.

℞. Calam. Laevig. . . . . grs. xl
Zinci Oxidi . . . . . grs. xx
Glycerini . . . . . ℥ xx
Aq. Destill. . . . . ad ℥ j

LOTIO SODII COMPOSITA.

℞. Sodii Carbon.
Sodii Chloridi
Sodii Biborat. . . . . āā ℥ j
Glycerini . . . . . ℥ ij
Aq. Destill. . . . . ad ℥ iv

PULVIS SPARGENDUS.

℞. Pulv. Amyli
Pulv. Calomel
Pulv. Zinci Ox. . . . . āā

Unguentum Flavum.

℞. Hydrarg. Ox. Flav. . . . . grs. iv
Ung. Simplicis . . . . . ℥ j

Unguentum Hydrargyri Ammoniati Dilutum.

℞. Hydr. Ammon. . . . . grs. v
Ung. Simplicis . . . . . ℥ j

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